NOVA SCOTIA
Environment and Labour

Reference Guide To The

OCCUPATIONAL SAFETY GENERAL REGULATIONS

Produced by the

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REFERENCE GUIDE TO THE OCCUPATIONAL SAFETY GENERAL REGULATIONS

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Part 1 - Title and Definitions

Citation

1 These regulations may be cited as the *Occupational Safety General Regulations*.

Definitions

2 In these regulations,

(a) "adequate" means sufficient to protect a person from injury or damage to health;

Adequacy is initially determined by the workplace parties, subject to appeal to the Department of Labour. Unless the regulations state, there is no requirement for an engineer's certification to prove adequacy. In cases of uncertainty the officers' may order a report pursuant to powers under the Occupational Health and Safety Act. (April 11, 2000)

(b) "ALI" means the Automatic Lift Institute;

(ba) "angle of repose" means the angle with the horizontal at which material will no longer flow freely;

(c) "ANSI" means the American National Standards Institute;

(d) "ASME" means the American Society of Mechanical Engineers;

(e) "ASTM" means the American Society for Testing and Materials;

(f) "CGSB" means the Canadian General Standards Board;

(g) "competent person" means a person who is
- (i) qualified because of that person's knowledge, training and experience to do the assigned work in a manner that will ensure the health and safety of every person in the workplace, and
- (ii) knowledgeable about the provisions of the Act and regulations that apply to the assigned work, and about potential or actual danger to health or safety associated with the assigned work;

Note that the definition is inclusive. The competent person must be qualified and knowledgeable. The following criteria may be used to evaluate competency:
- -education
- -training
- -knowledge
- -experience
- -familiarity with relevant occupational health and safety laws
- -familiarity with the workplace or work processes
- -familiarity with the potential and actual danger to health and safety associated with the work,
- -support services available to the service provider, and
- - any required certifications (ie. P.Eng.).
- - any required speciality within a professional certifications (ie. M.D. Occupational Medicine).(April 11, 2000)

(h) "CSA" means the Canadian Standards

Association;

(i) "demolition" means the destruction or removal of all, or part, of an existing building or structure;

(j) "designated" means designated, in writing, by the employer unless otherwise specifically provided;

The designation must be in writing and must be clear on a person-by-person basis who is covered and who is not; however, there is no requirement for individuals' names to appear on a list. It would be adequate to refer to job titles, or similar categories, as long as there is only one job title/category per individual. (April 11, 2000)

(k) "electrical installation" means the wires, machinery, apparatus, appliances, devices, material and equipment used or intended for use for the generation, transmission, distribution, supply and use of electrical power or energy, and includes a power line and power line equipment;

(l) "engineer" means a person who is registered as a member or licensed to practise under the *Engineering Profession Act* and is competent to do the work being performed;

The requirement that, in addition to being qualified pursuant to the Engineering Profession Act, an engineer in this definition must also be competent to perform the work in question. This is an issue to be determined according to the facts in each case.(June 11, 1999).

Under the Engineering Professions Act, APENS is the only group who can register or license. In addition, neither the Engineering Professions Act nor APENS recognizes out-of-province registrations. Out-of-province people must be licensed by APENS before they can practice in NS. Also, an article approved by an engineer in Ontario (for example) who is not licensed by APENS must be reapproved by an APENS engineer before it can be used under the *Occupational Safety General Regulation*. (April 11, 2000)

(m) "firefighter" means

(i) an employee who provides fire suppression services to the public from a fire department within a municipality or local service district, or

Volunteer fire fighters are not covered by the regulation. For a discussion of coverage of volunteers by OH&S legislation see the Reference Guide to the *Occupational Health and Safety Act*, Appendix A. With regards to "composite fire departments" the Health and Safety Act would provide coverage for volunteer firefighters where there activities would impact or place in a hazardous situation a regular firefighter. (April 11, 2000).

(ii) an industrial firefighter;

(n) "guardrail" means a system of vertical and horizontal members that warn of a fall hazard and reduce the risk of a fall;

The definition covers both permanent and temporary guardrails. The regulation is not meant to allow barrier tape as a guardrail; section 13 of the regulations stipulates the technical specifications of a guardrail. (April 11, 2000).

(o) "hazardous substance" means chemical or biological material, dangerous goods within the meaning of the *Dangerous Goods Transportation Act* or a controlled product within the meaning of the *Hazardous Products Act* (Canada) that is likely to, because of its harmful nature, cause injury or damage to the health or safety of a person exposed to it;

(p) "hoist" means a mechanical device or equipment and its structure used for moving, lifting, or lowering material, including a mobile crane, a tower crane, an electric overhead travelling crane, an automotive lift, a winch, a chain fall or other similar device, but does not include an industrial lift truck, a power operated elevating work platform, a device to which the *Elevators and Lifts Act* applies or a hoist that operates in a shaft in the underground at a mine;

The *Elevators and Lifts Act* applies to the installation of:
-elevating devices for the physically disabled
-passenger and freight elevators
-escalators
-dumbwaiters
-manlifts
-freight platform lifts
-personnel & material hoists
-moving walks
-incline lifts (such as ski-lifts)
This Act does not apply to: temporary hoisting mechanisms used for raising and lowering persons or materials during the construction, repair, alteration or demolition of buildings, structures or works (section 3(g)).; therefore all relevant sections of the *Occupational Safety General Regulations* apply to the above devices. (April 11, 2000).

Hoists are limited to devices that move "material." Devices designed exclusively to move people, such as patient lifts, are not covered. (April 11, 2000)

An exception to this is hoist used to lift or lower a person in and out of a manhole. This device is not covered by the Elevators and Lifts Act and is therfore captured by the OSGR. (July 20, 2001)

"Vertical Conveyors" are not covered under the Elevators and Lifts Act & Regulations or CSA B44-00 Safety Standard for Elevators; therefore they are to be considered "hoists" and are subject to the requirements of the Occupational Safety General Regulations. A "Vertical Conveyor" transports material or objects in a substantially vertical direction, usually with fully automatic loading and unloading, as part of a freight handling system. It is inoperable from inside the car and is not equipped with a platform for persons to ride on. (July 3, 2003)

The definition of "hoist" is meant to capture those devices whose primary function is to lift, raise and lower materials. It is not meant to capture positioning/lifting mechanisms integral to a machine whose overall function is not to primarily lift, raise and lower materials. Examples of excluded 'machines' would be: dump trucks (lifting mechanism to raise the buckets); back hoe/excavators (hydraulics to position/lift the bucket); press board making machines (mechanism to lift and separate plates); and a garage door opener. However, these all are still machines and are captured by the mechanical safety provisions in Section 84. (July 20, 2001)

(q) "industrial firefighter" means an employee who

(i) is designated to fight fires at the employee's place of employment, and

(ii) is employed by an employer who does not, in the normal course of its business, provide fire suppression services to the public;

(r) "industrial lift truck" means a self-propelled vehicle that

(i) is designed primarily to carry, lift, stack or tier material,
(ii) is equipped with an elevating mechanism, and
(iii) has a lifting capacity that is greater than 450 kg,
but does not include a hoist;

The definition is intended to be limited to forklifts and similar vehicles. (June 22, 1999).

The truck must be self-propelled. Hand trucks are not covered by this definition, although they are covered by the standards in this regulation dealing with forklifts. (May 7, 1999)

(s) "locked out" means to have

(i) isolated the energy source or sources from a machine, equipment, tool or electrical installation,

(ii) dissipated any residual energy in a system, and

(iii) secured the isolation of the energy source or sources by an inhibiting device that is operated by a key or other process,

and to have performed a "lock-out" has a similar meaning;

(u) "manufacturer's specifications" means

(i) the written instructions of a manufacturer of a machine, material, tool or equipment that outline the manner in which the machine, material, tool or equipment is to be erected, installed, assembled, started, operated, used, handled, stored, stopped, adjusted, carried, maintained, repaired, inspected, serviced, tested, cleaned or dismantled, and

(ii) an instruction, operating or maintenance manual and drawings respecting a machine, tool or equipment;

(ua) "mobile crane" means a mobile crane to which CSA standard CAN/CSA-Z150-98, "Safety Code on Mobile Cranes" applies;

(v) "NFPA" means the National Fire Protection Association;

(va) "overhead crane" means any mechanical device or structure that is used to raise, lower and move material that travels overhead and that incorporates a

(i) power driven drum, bridge and cable or rope,

Note: clause t - "machine" was repealed: O.I.C. 2000-130, N.S. Reg. 52/2000

Manufacturers's specifications may be in the form of instructions or recommendations. Only those specifications that are mandatory are enforceable by officers. (June 15, 1999.)

Where an engineer creates the equivalent of the manufacturers' specifications in various sections, one model they may follow is that set out in European Norm EN-292-1995 "Safety of Machinery Part 2 Technical Principles and Specifications". (April 11, 2000).

"Machine" or "machinery" are not specifically defined terms in these regulations; therefore, the definition will be that found commonly in English language dictionaries. For example: "A device with several moving parts which uses power to do a particular type of work" *Cambridge International Dictionary of English*, or "A device consisting of fixed and moving parts that modifies mechanical energy and transmits it in a more useful form" *Merriam-Websters WWWebster Dictionary*. (June 19, 2000)

(ii) single or multiple girder, and
(iii) moveable bridge carrying a moveable or fixed hoisting mechanism,

but does not include wall cranes, cantilever gantry cranes and semi-gantry cranes;

(w) "power line" means the above-ground or underground wiring that is used to distribute electricity;

(x) "power line equipment" means the components that are required to distribute electricity by means of a power line;

(y) "power operated elevating work platform" means a temporary horizontal working surface that provides access and support to a person at a workplace, and that is elevated and lowered by means of a mechanical, hydraulic, pneumatic or other powered mechanism and that complies with Section 36 of the *Fall Protection and Scaffolding Regulations*, including a standard listed in subsection (4) thereof;

(z) "powered mobile equipment" means self-propelled equipment that is designed to operate on land in conditions other than a public highway, but does not include equipment primarily designed to transport persons, an industrial lift truck or a power operated elevating work platform;

This definition covers all self-propelled equipment, except an industrial lift truck, any equipment primarily designed to transport persons, or a power operated elevating work platform, that is designed to operate off-highway. It does not matter if the equipment is or is not designed to be able to drive on highways. Note that there is no bar from something being defined as more than one thing. Thus, a boom truck with a telescopic boom and a hook and cable is a hoist, a mobile crane, powered mobile equipment, and a machine. (April 11, 2000).

(aa) "SAE" means the Society of Automotive Engineers;

(ab) "structural fire-fighting" means the activities of rescue, fire suppression and conservation of property from fires involving buildings, structures, vehicles, vessels, aircraft or other large objects constructed by human effort;

(ac) "surface mine" means a work or

undertaking, other than a trench, for the purpose of opening up, proving, removing or extracting any metallic or non-metallic mineral or mineral bearing substance, rock, earth, clay, sand or gravel by means of an open excavation, and includes a pit or quarry;

In addition to metallic or non-metallic mineral or mineral bearing substance, rock, earth, clay, sand or gravel, the definition includes coal, potash, gypsum, and salt. (June 22, 1999).

(ad) "tower crane" means any mechanical device or structure that

- (i) incorporates a power-driven drum and cable or rope and a vertical mast or tower and a jib,
- (ii) is of the traveling, fixed or climbing type, and
- (iii) is used exclusively for raising, lowering and moving material;

(ae) "trench" means an excavation in which the excavation depth exceeds the excavation width;

Note: there is no mention of a minimum depth, therefore all excavations/trenches are captured by the regulation; however, some regulatory requirements apply only at a depth of 1.2 meters or more (March 1, 2004)

(af) "work area" means a location at the workplace at which an employee is working, or may be required or permitted to work;

(ag) "worked" means drilled, blasted, extracted, excavated, loaded or subjected to other similar work.

Application

3 These regulations apply to all workplaces to which the *Occupational Health and Safety Act* applies, unless otherwise expressly provided.

Duties of parties

4 (1) Where these regulations impose a duty on an employer, the duty is also imposed on a contractor, constructor, supplier, employee, owner or self-employed person, to the extent of the contractor's, constructor's, supplier's, employee's, owner's or self-employed person's authority and ability to discharge the duty in the circumstances.

In order to make the regulation more readable, the term "employer" is used to represent all workplace parties. The responsibility of any workplace party extends to their ability and authority to control a specific circumstance. An example of this is S. 36 (1). The term "employer" is used in the section but may include responsibilities for the supplier of a chemical product. See *The Occupational Health and Safety Act* Reference Guide for more information on the duties of workplace parties (June 22, 1999).

(2) For the purpose of applying Section 23 of the Act,

(a) the person with the greatest authority and ability to ensure that a duty is discharged or a requirement is met is presumed to be the person with the greatest degree of control over the matter that is the subject of the duty or the requirement; and

(b) where a provision in a lease or other agreement relating to property rights gives a specified owner authority to control an aspect of lands or premises that are used as a workplace, the provision is *prima facie* evidence that the specified owner has the greatest degree of control over that aspect of the land or premises.

Where an "owner" in a lease has a responsibility in relation to land or premises, the existence of the lease is sufficient evidence that the duty in 4(2) (b) exists and the responsibility flowing from the duty. (June 22, 1999).

Conflict with incorporated standard

5 In the event of an inconsistency between these regulations and a standard incorporated by reference in these regulations, the regulations prevail over the standard to the extent of the inconsistency.

Compliance with specified editions of standards

6 (1) Subject to subsection (2), where these regulations require that an object, or activity in relation to an object, comply with an edition of a standard published in a specified year,

(a) if the requirement is to ensure that an object physically conforms to the standard, the object shall be deemed to comply with the standard if

(i) it conforms to the physical specifications contained in the latest version of the standard published at the object's date of manufacture, or

This section permits compliance with standards published in a year other than the one specified in the regulation where the health and safety aspects are adequately provided for in the earlier standard. (June 22, 1999)

(ii) in the event that no version of the standard existed at the object's date of manufacture, it conforms to generally accepted engineering principles prevailing at the object's date of manufacture,

Where the object is manufactured prior to any standard being in effect it would continue to be acceptable providing that it was manufactured in accordance with generally accepted engineering practices at the date of manufacture and provides for an adequate level of safety. (June 21, 1999)

unless there is evidence raising a reasonable doubt as to whether the object is adequate;

(b) if the requirement is to ensure that inspection, maintenance, use or other activity in relation to an object is carried out in accordance with the standard, compliance with the standard is required unless it is established that compliance with an earlier version of the standard, or with generally accepted engineering principles prevailing at the object's date of manufacture, is more likely to ensure adequate performance of the object.

The employer must be able to explain why it is more appropriate to comply with an earlier version of a standard, or with generally accepted engineering principles. A decision such as this should be made in consultation with the JOHSC or Representative, and /or technical experts, depending upon the details of the situation. For example Section 65 of the regulations call up standard SAE J386 NOV 97 Operator Restraint Systems for Off-Road Work Machines; however, a previous SAE J386 JUN 93 existed, so a machine which conformed with this standard at the time of manufacture would be permissible. (April 11, 2000, 1999)

(2) Subsection (1) does not apply to the requirement to conform to an edition of a standard appearing in subsection 10(1), Section 11, subsection 13(2), Section 14, subsections 16(2), 18(1), 45(2), and 134(4),

Earlier standards cannot be used when the issue deals with:

10(1) - standard on eye and face protectors

11 - standard on protective headwear

13(2) - standard on compressed breathing air and

Section 136, subsection 154(4), or Section 156.	systems 14 - standard on personal flotation devices 16(2) - a series of standards on lighting 18(1) - standard on drinking water 45(2) - standard on safe handling of compressed gases 134(4) - standard on full body harnesses 136 - standard on ground fault circuit interrupter 154(4) - standard on falsework 156 - standard on construction work in compressed air. (May 7, 1999)

Consultation and implementation

7 An employer developing or reviewing a written policy or procedure for the purpose of these regulations shall do so in consultation with the committee or representative, if any.

Where there is more than one JOHSC and/or representative at a workplace, unless otherwise stated in the rules of procedure for the JOHSC, or agreed to by the representatives, all JOHSC and/or representatives at the workplace must be consulted by the employer.

The rules of procedure for the committee may stipulate a different procedure for the consultation process. However, the alternative procedure must have at least one JOHSC and/or representative as the primary consultation tool. (June 22, 1999).

8 Where a written policy or procedure is developed for the purpose of the Act or these regulations, the employer shall ensure that

(a) the policy or procedure is adequate and implemented; and

(b) each employee required to perform a function under the policy or procedure is trained in respect of the policy or procedure generally, and in particular in the requirements relating to that employee.

Officers are to look for evidence that the policy or procedure is in use at the workplace. (June 17, 1999) The employer is required to train only those employees that could reasonably be expected to perform a function under the policy or procedure. (June 22, 1999)

Policies and procedures are enforceable as long as they are developed for the purpose of the Act or the regulations. Note: a Health and Safety Program is enforceable under the Act, not this section of the regulations. (April 11, 2000).

Record retention

8A An employer shall keep each record required to be kept under subsections 75(3), 80(9) and 130(10) for a period of 5 years after the date on which the record was made.

Part 3 - Personal Protective Equipment

Use of personal protective equipment

9 (1) An employer shall ensure that adequate personal protective equipment or devices required for an assigned task are used, based on

(a) the nature of the task;

(b) the location and conditions of the workplace; and

(c) any hazards that may affect the health and safety of people in the workplace.

(2) Where personal protective equipment or devices are required under the Act or these regulations, an employer shall ensure that

(a) an employee receives adequate training in the proper use and care of the personal protective equipment or devices; and

(b) an employee wears or uses the personal protective equipment or devices in accordance with the instruction and training provided.

(3) An employer shall ensure that all personal protective equipment or devices required under the Act or these regulations are

(a) maintained by a competent person; and

(b) tested or visually inspected before each use,

in accordance with the manufacturer's specifications.

(4) Where a person identifies any defect in

There may be PPE requirements that are not specified in this Part. However, the employer is required to ensure the use of, and in some cases provide, the type and level of PPE that is required for the assigned task, regardless of whether or not the specific hazard is referenced in this Part. For example, hearing protection is not specifically required in this Part. However, the employer is to ensure the use of PPE appropriate to the work to be performed. The *Occupational Health Regulations* establish threshold limit values for physical agents, including noise. (June 22, 1999).

Personal Protective Equipment is deemed to be portable protective equipment used by one person at a time; for example: vests, glasses, boots, gloves. But not seatbelts, guards on machines, etc. (April 11, 2000)

Most training pay and associated cost issues should be referred to the Labour Standards Division (if the employee is not unionized) or to the union grievance process. OH&S officers have authority to interpret and apply pay entitlements for employees in the following instances:
-joint occupational health and safety committee or health and safety representative training
-where payment is required by regulation
(December 14, 2000)

The training is to reflect the complexity of the equipment. (June 22, 1999).

personal protective equipment or devices that may impair the adequacy of the equipment or devices, the employer shall ensure that the personal protective equipment or devices are not used until they are repaired.

9A An employee shall wear or use personal protective equipment or devices as required under clause 9(2)(b).

Hazard to eyes, face or neck

10 (1) Where a person is exposed to a hazard that may irritate or injure the eyes, face, or front of the neck, an employer shall ensure that protective equipment is worn that is appropriate to the hazard and that complies with CSA standard CAN/CSA-Z94.3-99, "Industrial Eye and Face Protectors".

The standard requires that:
1) the following items bear a permanent mark identifying the manufacturer or supplier:
- lenses, excluding covers
- spectacle fronts (the part of the frame that holds the lenses)
- spectacle temples (the part of the frame that does not hold the lenses)
- removable side shields
- goggle eye cups
- goggle frames
- helmet bodies
- helmet headgear
- hand shields
- face-shield headgear (clause 12.1)

2) the mark of a nationally recognized testing agency be permanently placed on at least one component of an assembled product or system (clause 12.7)
Items that do not have these markings are not in compliance with the CSA standard.
Note that the CSA logo is not a requirement of the standard. (May 7, 1999)

(2) Subsection (1) does not apply if a person operating a chain saw is wearing adequate face protection as a substitute for the protective equipment referred to in subsection (1).

A face screen is commonly used as face protection in the forestry industry. (June 22, 1999).

Hazard to head

11 Where a person is exposed to a hazard that may injure the person's head, an employer shall ensure that protective equipment is worn that is appropriate to the hazard and that complies with CSA Standard

(a) CAN/CSA-Z94.1-92 (R1998), "Industrial Protective Headwear"; or

(b) CSA - Z94.1 - M1977, "Industrial Protective Headwear".

Where a manufacturer claims their product as being reversible, **and** the user has followed the instructions for reversing the suspension, a hard hat may be worn backwards. If either of these two conditions are not met the hat may not be worn backwards.

"Bump caps" are not covered by either of the two allowable standards and are not allowed where there is a hazard of head injury. (April 11, 2000)

The standard sets out 3 classes of headwear:
Class C - provides protection against impact and penetration only
Class E - provides protection against impact and penetration and electrical contact (tested to 20kV)
Class G - provides protection against impact and penetration and electrical contact (tested to 2.2kV)
(May 7, 1999)

The headwear is tested without any attachments. (May 7, 1999)

Each headwear must be marked with:
- the manufacturer's identity
- the model designation
- the class of protection
- the year and month of manufacture
- the size or size range
- warning statement about replacing headwear after a severe impact, no painting, only approved decals, no modifications" (May 7, 1999)

The standard contains an Appendix A, explicitly noted as "not a mandatory part of this standard." It repeats some of the items covered in the warning statement required above. (May 7, 1999)

The standard does not outline when the various classes should be used. (May 7, 1999)

The standard bans the application of paint or decals to hard hats as they can: create hot spots that can weaken the shell; and cover cracks or other imperfections. (August 1, 2004)

The Regulations do not explicitly require a "new" hard hat. That said, the hard hat must be safe itself. Two areas where a used hard hat may raise caution flags are:

1) a previous blow to the hard hat, which may have weakened it to the point it is unsafe, but still not be visible. Many owners manuals warn of precisely this issue.
2) the hygienic characteristics of the hard hat, where one wearer may leave residual oils or greases on the hat suspension.
Overall, while it is not strictly illegal to assign a used hard hat, it is the employer's responsibility to ensure that it is safe for its intended purpose. (May 7, 1999)

Foam lined hard hats are covered by Z94.1-92 (R1998) - the standard **does not** have any life expectancy or discard age for the foam lining; therefore there is no requirement in the regulations to dispose of the foam lined hard hats after a specified time period (Feb 01, 2004)

Hazard to foot or skin

12 (1) Where a person is exposed to a hazard that may injure the person's foot, an employer shall ensure that protective equipment is worn that is appropriate to the hazard and that complies with CSA standard CAN/CSA-Z195-M92, "Protective Footwear".

Footwear meeting CSA standards shall be permanently marked as follows:
- manufacturer's name
- grade of toe protection and type of additional protection (i.e. sole, electrical)
- month and year of manufacture

Footwear meeting the standard but with no sole protection needs no external identification. (June 14, 1999)

- Grade 1 footwear with sole protection shall have a green triangle
- Grade 2 footwear with sole protection shall have a yellow triangle
- Grade 3 footwear with sole protection shall have a red triangle
- footwear incorporating electrical shock resistance shall have a white rectangle. (May 7, 1999)

Toe protection must be a manufactured part of the foot wear -"toe caps" do not meet the standard. June (14, 1999).

The standard contains an Appendix A, explicitly noted as "not a mandatory part of this standard." It suggests the following uses for each class:
- grade 3 - hospital workers
- grade 2 - retail workers
- grade 1 - all other working environments
- sole protection is recommended in the construction industry plus any workplace where nails or sharp objects present a penetration hazard
- electrical shock resistant soles are recommended to reduce the risk injury from electrical contacts (June 14, 1999.)

(2) Where a person is exposed to a hazard that may injure the skin, an employer shall ensure that adequate protection is worn or used.

Department of Labour Officers will require Grade 1 footwear with sole protection on construction sites unless there is clearly no hazard to the foot. (June 22, 1999).

Respiratory hazard

13 (1) Where a person is exposed to a respiratory hazard that may cause injury or disease, an employer shall provide and ensure the use of adequate respiratory protective equipment that is appropriate to the hazard.

Note that in this section, in addition to ensuring employees use the equipment, the employer is also required to provide the equipment. "Provide" means the employer will incur the cost of the equipment. (June 14, 1999).

(2) An employer shall ensure that the compressed breathing air used in self-contained respiratory protective equipment complies with or exceeds CSA standard CAN3-Z180.1-M85, "Compressed Breathing Air and Systems".

The regulation is only requiring air used in SCBA's to meet the CSA standard. Compressed air used in air line respirators, sandblasting hoods, etc. is not being addressed here. The standard would apply to emergency escape bottles used on some supplied air respirators. (May 7, 1999)

The regulation is not calling up the entire standard on "Compressed Breathing Air and Systems." It is only calling up those parts that deal with air standards. Specifically, those are set out in clause 5.5 of the standard. The standards are:

Oxygen	19.5 to 22.5%
Carbon monoxide	5 ppm
Carbon dioxide	500 ppm
Methane	25 ppm
Non methane hydrocarbons	As set out in TLV book
Nitrogen dioxide	0.3 ppm
Nitrous oxide	2.5 ppm
Halogenated hydrocarbons	5 ppm
Oil, particulates, condensates	1 mg/m^3
Water	Dew point 5°C below lowest line temperature. Maximum dew point of -53°C for pressures of 12.4 MPa (1800 psi) and above
Odour	None detectable
Other	As set out in TLV book

Note that failure of any component in the above table means that the whole sample fails. (May 7, 1999)

(3) An employer shall ensure compliance with CSA standard CSA Z94.4-93 (R1997), "Selection, Use, and Care of Respirators", in respect of

Sub-section 13(3) does **NOT require** the use of qualitative and quantitative fit tests as set out in section 7 and appendices B and C of CSA Z94.4-93(R1997), "Selection, Use, and Care of Respirators". This is because these are **tests used to**

(a) the training of users of self-contained respiratory protective equipment; and

(b) the use, maintenance and testing of respiratory protective equipment.

(4) Despite clause 3(b), except as required under Section 196, an employer is not required to ensure the quantitative fit testing of respirators.

select a respirator.

Sub-section 13(3) **DOES require** a "field check" of the respirator before each use, as set out in clause 9.1.3 of the standard. **Non-mandatory** examples of field checks can be found in Appendix A of the standard. December 5, 2001.

See clause 9(2)(a) for information on training and associated costs (December 14, 2000)

A written respiratory protection program (operating procedures) is required by clause 3.2.1 of the Standard (Feb 01, 2004)

Risk of drowning

14 Where a person is exposed to the risk of drowning, an employer shall provide and ensure the use of a personal flotation device that complies with CGSB standard CAN/CGSB-65.11-M88, "Personal Flotation Devices" or an alternative means of protection that provides an equivalent level of safety to prevent the person from drowning.

This standard covers Personal Flotation Devices for persons over 41 kg (90 pounds) designed to be worn continuously. There are two types:
1 - inherently buoyant
2 - some inherent buoyancy supplemented by an inflatable device. (May 20, 1999)

An approved PFD will have the following label:

"Personal Flotation Device
Designed for chest size _________ to ________
Manufactured by ______________
in (month and year of manufacture)
Lot number ______ to conform to standard
CAN/CGSB-65.11-M88, Type __________
Buoyancy, 69 N minimum (15 -1/2 pounds force)
Approved by the Department of Transport, Canada
Approval No. ____________
DIAGRAM OR SKETCH SHOWING HOW THE PDF IS TO BE USED

THIS PFD IS DESIGNED TO BE WORN. WEAR IT!

CAUTION:

1. This device may lose buoyancy over a period of time and become no longer serviceable. The water performance should be checked regularly during each season to determine that it provides adequate buoyancy for your needs.
2. Orange, red and yellow PFDs are recommended for higher visibility." (May 20, 1999)

All approved PFDs must be bright yellow, orange or red on the outside. (May 20, 1999)

Where an employee weighs less than 40 kg. (90 lbs.), the employer must ensure the employee has an appropriate flotation device. (April 11, 2000).

Part 4 - Ventilation, Lighting, Sanitation and Accommodation

Ventilation

15 An employer shall

(a) provide for a supply of fresh air into, and the removal of air from, a workplace or part thereof that is, so far as is reasonably practicable, sufficient to

(i) keep the air reasonably pure, and

(ii) render harmless all gases, vapours, dust or other impurities that are likely to endanger the health or safety of any person therein;

"Fresh air" means outdoor air that is of similar quality to ambient air in the surrounding area. The entrainment of exhaust air should be avoided where reasonably practicable. (June 22, 1999).

For guidance in determining "reasonably pure" the following standards may be used:
-CAN/CSA -Z412-M89 Office Ergonomics
-CAN/CSA - Z204 - 94 Guideline for Managing Indoor Air Quality in Office Buildings
-ASHRAE 62- 89 Ventilation for Acceptable Indoor Air Quality. (June 22, 1999)

Harmless" means meeting the TLV's, where they exist, unless specific circumstances warrant some other interpretation. (May 7, 1999)

(b) where a process is carried on that produces a gas, vapour, dust or other impurity that is likely to be inhaled to an injurious extent by a person in the workplace, provide and use such mechanical means as are capable of

(i) preventing such inhalation so far as is reasonably practicable,

(ii) effectively carrying off and disposing of the impurity, and

(iii) preventing the recirculation and re-entry into the workplace of air containing the impurity; and

"Likely to be inhaled to an injurious extent" means exceeding the TLV's, where they exist, unless specific circumstances warrant some other interpretation. (May 7, 1999)

Where a process is carried on that produces a gas, vapour, dust or other impurity that is likely to be inhaled to an injurious extent the employer must use mechanical means capable of preventing injurious inhalation, carrying away the impurity, and preventing recirculation into the workplace the air with the impurity. (June 22, 1999)

(c) ensure that all ventilation systems used for controlling the dissemination of gases, vapours, dust or other impurities, including their collection systems and emptying processes, are designed, installed, operated, maintained and repaired in an adequate manner by a competent person.

Lighting

16 (1) An employer shall ensure the provision of lighting that is sufficient for the type of work being done considering

- (a) the quantity of illumination; and
- (b) the quality of illumination, including reflectance, direct glare and reflected glare.

(2) Where it is reasonably practicable, considering the nature of the work, an employer shall use the applicable ANSI standard listed below to determine the lighting required by subsection (1):

- (a) ANSI/IES-RP-7-1991, "American National Standard Practice for Industrial Lighting"; or
- (b) ANSI/IESNA RP-1- 1993, "American National Standard Practice for Office Lighting".

Where lighting supplied meet one of the standards referenced in this section, it is deemed to be adequate unless the officer has reason to believe otherwise. (June 22, 1999)

Where lighting does not meet one of the standards referenced in this section and the Department of Labour Officer has formed an opinion that the lighting is insufficient, the officer may issue an order requiring the employer to provide sufficient lighting . (June 22, 1999).

These lighting standards are all written in non-mandatory language. Thus, they should be used as guidelines only. Standards not referenced in this section may also be used as a guideline.(August 24, 1999).

17 Where failure of the normal lighting system may constitute a danger to the health or safety of a person, the employer shall ensure that emergency lighting is available.

This section applies to emergency lighting for escape purposes. (June 22, 1999)

"Normal lighting" is understood to be lighting designed for the workplace (see section 16 for standards). (April 11, 2000).

Unless proven otherwise lighting under 100 lux (10 foot candles) will be deemed to "constitute a danger". (April 11, 2000).

Drinking water

18 **(1)** An employer shall, where reasonably practicable, make accessible sufficient potable water for drinking and hand-cleaning that

- (a) is close enough to the work area that neither drinking nor washing is inhibited;
- (b) is no further away than 200 m from the work place; and

200 m = approximately 655 ft / 220 yds (April 26, 2000)

- (c) meets the standards set out in the publication entitled *Guidelines for Canadian Drinking Water Quality*, Sixth Edition, published under the authority of the Minister of Health Canada, 1996.

These guidelines are all written in non-mandatory language. (April 11, 2000).

(2) Where drinking water is not taken directly from a water pipe, an employer shall ensure that it is kept in a container that is covered in an adequate manner and, if used by more than one person, that the container is equipped with a faucet.

(3) An employer shall, where reasonably practicable, make accessible individual sanitary drinking vessels or cups to be used with drinking water, except where the drinking water is delivered in an upward jet from which a person may drink.

The upward jet must be at least 2.5 cm (1 inch) high. (May 7, 1999)

(4) Where outlets exist for both drinking water and water not suitable for drinking, an employer shall appropriately and clearly label the outlets.

Toilets

19 **(1)** An employer shall make accessible a minimum number of toilets for each gender, determined according to the maximum number of people of each gender who are normally employed at any one time at the same workplace, as follows:

- (a) where the number of people does not exceed 9, 1 toilet;
- (b) where the number of people exceeds 9 but does not exceed 24, 2 toilets;
- (c) where the number of people exceeds 24 but does not exceed 49, 3 toilets;
- (d) where the number of people exceeds 49 but does not exceed 74, 4 toilets;
- (e) where the number of people exceeds 74 but does not exceed 100, 5 toilets; and
- (f) where the number of people exceeds 100, 5 toilets and 1 toilet for every 30 such people in excess of 100.

(2) Despite subsection (1), where a workplace, such as a motor vehicle or an isolated small temporary workplace such as a logging operation or a survey site, does not have running water or sewage facilities, an employer shall ensure that the toilets required in subsection (1) are accessible where it is reasonably practicable.

(3) Despite subsection (1), where the total number of people normally employed in the workplace at any one time does not exceed 9, an employer may provide 1 toilet for both male and female persons if the toilet is situated in a room with an entrance door that is fitted on the inside with a locking device.

(4) Despite subsection (1), where more than 2

"Normally employed" means the employment is predictable and scheduled in nature.(June 22, 1999).

The employer will make toilets accessible on the first day employees arrive to perform work. (June 22, 1999).

Note that only employees are counted here. (May 7, 1999)

In this section "people" refers to a gender. For example, if the workplace has 6 women and 5 men, the employer must provide 2 toilets - 1 for the 6 women, and 1 for the 5 men. (June 16, 1999)

These requirements also apply to farms and orchards; however there are no specific requirements as to placement other than 19(6)- within easy access of a person's workplace (Feb 01, 2004) toilets are required for male employees, an employer may substitute urinals for up to ⅔ of the required number of toilets.

For example, if according to (1) the employer is required to supply 3 toilets for male employees , the employer may provide 1 toilet and 2 urinals. (June 16, 1999).

(5) An employer shall ensure that toilets are of the water flush, chemical, self-contained portable or other similar types of toilets.

(6) An employer shall ensure that a toilet facility required by these regulations is

(a) within easy access of a person's workplace;

A toilet in a neighbouring facility or business is within "easy access" if: 1) it is reasonably close, 2) a prior agreement exists between the employer and the owner of the neighbouring toilet to allow its unhindered use, 3) the number of toilets is adequate considering the total number of workers at any one time who may be present all workplaces using the toilet at one time. 4) employees are permitted to leave the workplace. (June 22, 1999).

(b) enclosed so that a person is sheltered from view and protected from the natural elements;

(c) adequately ventilated and illuminated;

(d) heated, where reasonably practicable;

(e) kept in a clean and sanitary condition;

(f) provided with a sufficient supply of toilet paper;

(g) provided with a waste receptacle;

(h) maintained in working condition; and

(i) in the case of a self-contained unit, emptied and serviced at intervals to ensure that the unit does not overflow.

(7) An employer shall ensure that an employee has reasonable opportunities to use the toilet facilities.

Hand-cleaning facilities

20 (1) Where the workplace has running water, an employer shall provide a wash basin or equivalent hand-cleaning facility in a room with 1 toilet and sufficient additional wash basins or equivalent hand-cleaning facilities in the room for additional toilets or urinals.	Where both genders are employed, wash basins must be present in at least some washrooms for both genders. (May 7, 1999)
(2) Where the workplace does not have running water and toilet facilities are provided, an employer shall provide hand-cleaning facilities or supplies, where it is reasonably practicable.	"Running water" means supplied by plumbing (June 16, 1999).
(3) An employer shall provide a hand-cleaning facility and supplies as close to the toilet as is reasonably practicable and provide sufficient additional hand-cleaning facilities as close as is reasonably practicable to additional toilets.	."Facilities and supplies for hand-cleaning" includes -wash basin -water for cleaning -soap/cleanser -sanitary hand-drying facilities -waterless hand cleaners (June 22, 1999).
(4) Where a person works in an area that is exposed to a hazardous substance that may contaminate food, an employer shall provide the person with the opportunity, facilities and supplies for hand-cleaning.	
(5) Where a wash basin is provided, an employer shall provide	
(a) hot and cold running water;	
(b) soap or other appropriate cleansers; and	
(c) sufficient sanitary hand-drying facilities.	Note that a shared towel is not considered sanitary. (May 7, 1999)

Eating areas

21 (1) Where the possibility of contamination of food from a hazardous substance exists in a work area, an employer shall provide an enclosed eating area separate from the work area.

"Separate" means far enough away from the location of the source of the hazardous substance so as to prevent contamination of food.(June 16, 1999)

"Provide" includes reasonably close access to a restaurant, cafeteria, or other similar facility where a prior agreement exists between the employer and the owner of the facility to allow use. (June 22, 1999).

(2) The eating area referred to in subsection (1) shall be

(a) kept in a sanitary condition; and

(b) adequately provided with

(i) light, heat and ventilation,

(ii) tables and seating sufficient for the number of people who use the eating area at any one time, and

(iii) garbage receptacles.

When considering the "eating area" two key criteria should be used: 1) distance/separation, is the space far away enough from the possibility of contamination, and 2) enclosed, is the space protected from adverse weather. A separate enclosed eating area may be in a "lunch room" but not always. (April 11, 2000).

(3) No person shall store food or drink in an area where the food or drink may be contaminated by a hazardous substance.

Note that storage of food in a refrigerator also used for samples or hazardous chemicals is banned. (June 22, 1999).

Work clothes and change rooms

22 (1) Where the nature of a person's work makes it necessary for the person to change out of street clothes and into work clothes to protect the person's health or safety, an employer shall provide a changing room and storage for the person's street clothes and work clothes that will prevent the clothes from becoming wet or dirty.

(2) Where a person's work clothes are liable to be contaminated so that the health or safety of a person may be adversely affected by exposure to the clothes when contaminated, an employer shall provide

(a) work clothes for the person's use;

(b) storage for the person's street clothes and work clothes that will prevent the street clothes from becoming wet, dirty or contaminated;

(c) a changing room; and

(d) for work clothes to be cleaned as necessary.

(3) Where an employee's skin may be contaminated by a hazardous substance, an employer shall provide a shower facility if it is reasonably practicable.

(4) For the purposes of subsection (3), the employer shall provide a shower facility that includes

(a) a number of showers for each gender determined according to the maximum number of people of each gender who are normally employed at the same workplace and who are exposed as described in subsection (3) at any one time as follows:

"Normally employed" means the employment is predictable and scheduled in nature.(June 22, 1999).

(i) where the number of

employees does not exceed 10, 1 shower, and

(ii) an additional shower for each unit of 10 additional employees of each gender;

(b) a sufficient water supply that can be manually adjusted to come within a range of 35°C and 45°C; and

35 to 45° C = approximately 95 to 113° (April 26, 2000)

(c) sufficient soap and towels.

Emergency showers and eyewashes

23 (1) Where a person's skin or eyes may be acutely affected by an exposure to a caustic, acidic or other hazardous substance, an employer shall, as necessary in the circumstances, provide

(a) an emergency shower;

ANSI Z358.1 *Emergency Eyewash and Shower Equipment* defines an emergency shower as "a unit that enables a user to have water cascading over the entire body". (April 11, 2000).

The above standard is available in the DOL library and may be used for guidance. Also, other standards exist and may be appropriate under certain circumstances. However, orders should not normally be written to require compliance with the standards. Such orders are only appropriate in exceptional circumstances. (April 11, 2000)

(b) an eye wash fountain; or

An eye wash bottle or portable eye stations may be sufficient for the removal of substances under certain circumstances. (August 24, 1999).

(c) other equipment sufficient for removal of the substance

in the work area where the exposure may occur.

(2) An employer shall ensure that an adequate emergency shower or eye wash fountain is designed, installed, inspected, tested, maintained and operated in accordance with the manufacturer's specifications.

Housekeeping

24 An employer shall ensure that waste material and debris are removed from a workplace to a suitable disposal area on a regular basis, so as to prevent a hazard.

"Suitable disposal area" is deemed to be an area where waste material and debris may be safely and legally (environmental concerns) kept. (April 11, 2000).

Fire protection and escape

25 (1) An employer shall ensure that adequate fire protection is provided in the workplace.	This section does not require a fire extinguisher in a vehicle. If an employer does install a fire extinguisher in a vehicle they and their employees should be aware of the hazards inherent in fighting vehicle fires (June 23, 2000)
(2) An employer shall maintain and service the fire protection equipment required in subsection (1) in accordance with the manufacturer's specifications.	
(3) In determining the type and quantity of fire protection required in subsection (1), an employer shall consider (a) where the workplace is an occupied or enclosed structure, the *Fire Prevention Act*; or (b) where the workplace is a project, Part 8 of the *Nova Scotia Building Code* under the *Building Code Act*.	"Fire protection equipment" is deemed to be any device designed to extinguish fires; for example: sprinklers, fire extinguishers, foam ejectors, etc. (April 11, 2000) Department of Labour officers will review inspection records of fire extinguishers. If it appears that the fire extinguisher has not been inspected in the last twelve months, the officer will ask the employer to verify that the fire extinguisher has been inspected in accordance with manufacturers specifications. (June 22, 1999).
(4) Subject to the *Fire Prevention Act*, unless each person present in the workplace has suitable keys to all doors that are required to be open to exit the premises, no person shall lock, bolt or bar a door while a person is present in the workplace, if doing so would prevent a person from exiting a work area.	Note that not all doors must be open. Just those required to allow for safe emergency egress. (June 16, 1999)
(5) The requirements of subsection (4) do not apply to a room in which a legally restrained person is located and other means of protection from fire are provided.	

Part 5 - Handling And Storage of Material

General handling of objects and material

26 Where the lifting or moving of a thing or person may be a hazard to the health or safety of a person at the workplace, an employer shall ensure that

- (a) adequate and appropriate equipment for the lifting and moving is provided; and
- (b) training and instruction as to the appropriate method of performing the lifting and moving is provided in accordance with the equipment manufacturer's instructions, or, where there are no equipment manufacturer's instructions, in accordance with adequate work methods and lifting and moving techniques..

One guide for evaluating whether a specific lifting or moving operation is a hazard is the NIOSH lifing equation ; this can be obtained by contacting the National Institute for Occupational Safety and Health of the United States Department of Health and Human Services directly. (April 11, 2000).

See clause 9(2)(a) for information on training and associated costs (December 14, 2000)

27	(1) An employer shall ensure that where rubbish or debris is moved, it is carried in suitable containers, or moved by means of chutes or other safe methods that provide an equivalent degree of protection.	Debris shall be removed before it becomes a hazard. (August 11, 1999).
	(2) An employer shall ensure that a chute or other safe method that provides an equivalent degree of protection is used where rubbish or debris is lowered more than 6 m vertically.	A "chute" is an inclined plane, sloping channel, or passage down, or through which things may pass (dictionary) . A tarpaulin, if it meets all three sections, can be a chute. (April 11, 2000) 6m vertically = approximately 20 ft (April 26, 2000)
	(3) Subsections (1) and (2) do not apply during demolitions if (a) a heavy weight suspended by a cable from a crane or other hoist; or (b) a power shovel, bulldozer or other powered mobile equipment, is used to conduct the demolition.	

28 An employer shall ensure that a chute

(a) is well constructed and rigidly fastened;

(b) if at more than 45° to the horizontal, is enclosed on all sides; and

(c) has an adequate gate on every loading entrance and at the bottom.

The gate has to be adequate in preventing the accidental discharge of debris, material, etc. (April 11, 2000)

29 An employer shall ensure that the entrance to a chute

(a) has a 100 mm by 100 mm or larger curb or cleat, where the entrance is at or below the floor level;

100mm by 100mm = approximately 4 in by 4in (April 26, 2000)

(b) is not more than 1.2 m above the floor; and

This refers to the bottom of the entrance of the chute. 1.2 m = approximately 4 ft (April 26, 2000)

(c) is kept closed when not in use.

Bulk material in bins, hoppers and tanks

30 An employer shall ensure that a bin, hopper, tank or other similar structure used to store combustible bulk material

(a) has a lid, an adequate ventilation system and is fire resistant; or

(b) has alternative measures that provide an equivalent level of safety.

A "similar structure" may be any large container, other than a carboy or barrel, that can be used to store combustible bulk dry material. Examples of combustible bulk dry materials include sawdust, flour, etc.(April 11, 2000).

This section does apply to a "garbage bin" at a project where it is being used to store combustible bulk dry material .(April 11, 2000).

Ventilation would have to reduce and maintain the combustible bulk dry material at its Lower Explosive Limit. (April 11, 2000).

31 Where a person is likely to be endangered by clogs in bulk material stored in a bin, hopper, tank or other similar structure, an employer shall establish a written work procedure for the safe breaking up of clogs and shall ensure that a copy of the work procedure is readily available near the bin, hopper, tank or structure.

In the absence of other information, a person is assumed to be endangered when they must stand on, or under, a pile of bulk material in order to break a clog and therefore must develop a written work procedure. (April 11, 2000)

The requirements for confined space entry may apply. Refer to Part 12 Confined Space Entry for requirements. (June 29, 1999).

Piled material

32 An employer shall ensure that piled material is

- (a) located so as not to interfere with
  - (i) illumination,
  - (ii) ventilation,
  - (iii) means of access and exit,
  - (iv) passageways or traffic lanes,
  - (v) the operation of machines,
  - (vi) sprinklers and firefighting equipment, or
  - (vii) electrical panels or energized electrical power lines;
- (b) located on a firm foundation that is able to support the load;
- (c) located so that the pile is not resting against a partition or wall of a building unless the partition or wall is designed to support the load;
- (d) arranged in a manner that makes it stable;
- (e) protected from conditions that may significantly damage the structural integrity of any container used to store the material; and
- (f) regularly inspected for hazards.

Piled material includes boxes, pallets, barrels, sacks and unconsolidated bulk material. (August 11, 1999).

33 Where pipes, bar stock or other material or objects may create a hazard by rolling, an employer shall ensure that the piled material is stacked in a manner to prevent rolling.

Some options may include: racks that slope upwards from a wall, racks with vertical bars at open ends. (April 11, 2000).

Bar stock is deemed to be any cylindrical object such as: rigid tubing, rebar, etc.

34 (1) Where unconsolidated bulk material is stockpiled, an employer shall ensure that it is inspected by a competent person to determine if it is in a safe condition before a person is permitted to work close to or on the pile.

(2) Where unconsolidated bulk material is stockpiled and removed by means of powered mobile equipment, an employer shall ensure that

(a) the working face of the unconsolidated bulk material is sloped at the angle of repose;

(b) the vertical height of the working face of the unconsolidated bulk material is not more than 1.5 m above the maximum reach of the equipment; or

1.5 m = approximately 5 ft (April 26, 2000)

(c) the work is performed in accordance with written specifications and a written safe work procedure certified by,

(i) in the case where there is a possibility that the material could collapse onto the equipment or a person, an engineer, following consultation with the committee or representative, if any, or

(ii) in the case where there is no possibility that the material could collapse onto the equipment or a person, a competent person, following consultation with the committee or representative, if any.

(3) Where the face of unconsolidated bulk material is undermined or undercut by means of powered mobile equipment, an employer shall ensure that the undermining or undercutting is

"Undermining" and "undercutting" have the same meaning. The term "undercutting" is used in Part 15 Surface Mine Workings. (June 29, 1999).

(a) restricted to the depth of the bucket of the powered mobile equipment;

(b) permitted only when the approach of the powered mobile equipment is at a 90° angle plus or minus 5° to the face of the material; and

(c) performed in accordance with written specifications and a written safe work procedure certified by,

  (i) in the case where there is a possibility that the material could collapse onto the equipment or a person, an engineer, following consultation with the committee or representative, if any, or

  (ii) in the case where there is no possibility that the material could collapse onto the equipment or a person, a competent person, following consultation with the committee or representative, if any.

(4) Where unconsolidated material is loaded or unloaded from a vehicle or equipment, an employer shall ensure that adequate precautions are taken to ensure that the vehicle or equipment does not overturn.

35 An employer shall ensure that any material or debris is collected, and removed or positioned so as not to endanger the health or safety of a person at the workplace.

Hazardous substance storage

36 **(1)** An employer shall ensure that a container used for storing a hazardous substance is designed, constructed and maintained in an adequate manner.

(2) In determining whether or not a container is adequate, an employer shall consider

- (a) the material safety data sheet for the substance, if one exists;

Note that the MSDS requirement is only one criterion for evaluating safe storage. Failure to follow an MSDS requirement is not a violation in and of itself. (May 7, 1999)

- (b) information provided by the supplier;
- (c) whether there is a means of ensuring that a leak can be readily detected;

A means of detection may include: alarm, sensor, dye, regular visual inspection, inventory control, etc. (April 11, 2000).

- (d) the location where the container is stored, including
  - (i) the foundation on which the container is placed, and its ability to resist reaction with the hazardous substance, and
  - (ii) the need for overflow pipes, catch basins and other similar devices to ensure that the contents of the hazardous substance are contained in case of a leak; and
- (e) the need to ensure that the container does not significantly corrode from exposure to the hazardous substance in the container.

37 Where a container has been used to store a hazardous substance and the container will not be refilled with the same or a compatible substance, an employer shall ensure that the container is cleaned in an adequate manner without undue delay, unless the container is rendered unusable.

"Render unusable" includes such actions as: crushing, puncturing, cutting in pieces, removing top and bottom, etc. This section would include batteries, gas tanks, etc.

38 **(1)** In this Section "carboy" means a bottle or container for liquids of a 20 L capacity or greater, but less than 75 L, and made of glass, plastic or metal.

(2) An employer shall ensure that a carboy containing a liquid hazardous substance is

(a) if the carboy is made of glass, individually encased in a basket or box or other suitable container cushioned with noncombustible packing during transportation;

(b) stored with compatible material in a storage area or building with flooring that is resistant to the chemical being stored;

(c) not piled on top of another carboy, unless piled in accordance with the manufacturer's specifications;

(d) placed in a suitable storage rack or on strips laid on the floor; and

(e) stored in accordance with the manufacturer's specifications.

(3) The employer shall ensure that a carboy holding a liquid hazardous substance is in adequate condition.

20 litres is 4.4 imperial gallons; 75 litres is 16.5 imperial gallons. (May 7, 1999)

It does not cover transportation by hand within a facility. (April 11, 1999)

39 Where a hazardous substance is likely to create a hazard if it reacts with another substance, an employer shall ensure that the substances are stored separately.

Stored separately does not mean that it must be in a separate room. It means that, under reasonably predictable circumstances, no action or accident will result in their mixing. (May 7, 1999)

40 (1) An employer shall ensure that piping and associated equipment is

(a) constituted of material that will not significantly deteriorate because of any hazardous substance contained within it; and

(b) maintained in adequate operating condition.

(2) For each pipe and associated equipment referred to in subsection (1), an employer shall establish an inspection schedule and conduct inspections according to that schedule.

41 Where a hazardous substance is used in a workplace in such quantities that a spill could affect the health or safety of a person, an employer shall ensure that

(a) it is kept only in working quantities in areas where a person is working;

(b) a written emergency procedure that includes the use of emergency equipment, if necessary, is developed for use in the event of escape of a hazardous substance; and

MSDS information may be used as a source of information for the written emergency procedure. (June 29, 1999).

(c) any spillage of a hazardous substance is immediately cleaned up in an adequate manner.

Rechargeable storage batteries

42 (1) An employer shall ensure that the electric charging of rechargeable storage batteries is performed in accordance with the battery manufacturer's specifications.

(2) Where the electric charging of rechargeable storage batteries is routinely performed, and there are reasonable grounds to believe that contaminants are likely to be generated during the charging process, an employer shall obtain an assessment in writing from a competent person, who shall

(a) consult with the committee or representative, if any; and

(b) determine whether the charging is likely to cause an explosive mixture of hydrogen or the release of another hazardous substance.

(3) Where the assessment referred to in subsection (2) determines that the electric charging of rechargeable storage batteries is likely to cause an explosive mixture of hydrogen or the release of another hazardous substance, an employer shall ensure that

(a) electric charging is performed in a designated area or room that

(i) is adequately ventilated to prevent the accumulation of flammable gases,

(ii) is marked at the entrance with a notice prohibiting smoking or open flames,

(iii) has a floor made of non-sparking material, and

(iv) where rechargeable storage batteries are mounted in trays or on racks, has level trays or racks constructed or covered with non-sparking

Examples of rechargeable batteries include: automotive batteries, nickel cadium (NICADS), lithium, etc. (April 11, 2000).

material and of sufficient strength to carry the weight of the batteries; and

(b) a person who connects or disconnects rechargeable storage batteries for the purpose of electric charging uses non-sparking tools.

(4) An employer shall ensure that a competent person prepares a written review of the assessment required in subsection (2) on an annual basis or when there is a change in the process or volume of electric charging, whichever is the lesser period of time.

(5) Where electrolyte is spilled, an employer shall ensure that the spill is immediately cleaned up in an adequate manner to neutralize the electrolyte.

43 (1) An employer shall ensure that a competent person changes or charges a rechargeable storage battery.

(2) Where a rechargeable storage battery is charged, or filled with or drained of electrolyte, an employer shall

- (a) provide an employee performing this work with
  - (i) goggles and a face shield,
  - (ii) acid resistant gloves, and
  - (iii) an acid resistant apron; and
- (b) ensure that an employee uses this personal protective equipment while performing this work.

Part 3 Personal Protective equipment stipulates the requirements for PPE which includes appropriate foot protection. Note that in this instance the employer is required to provide the equipment outlined in subsection (2)(a). (August, 1999).

Goggles and face shields need to be chemical splash proof where warranted. (April 11, 2000).

Employers should bear in mind the requirements of section 23 when recharging batteries. (April 11, 2000)

44 An employer shall ensure that a rechargeable storage battery

(a) is adequately secured when in use or during charging;

(b) has unobstructed ventilation openings; and

(c) where it contains an electrolyte and is of no further use, is disposed of in a manner that prevents unintentional spillage of electrolyte.

Compressed gas

45 (1) An employer shall ensure that compressed gas in a container is used, stored and handled in an adequate manner.

For the purposes of the regulation, unless a standard gives another definition, "compressed" shall be taken to mean:
i) any gas with an absolute at or above pressure 40 psi (276 kPa) at 70 °F (21 °C) This means that the regulator would read roughly 25 psi (174 kPa).
ii) any gas with an absolute at or above pressure 104 psi (717 kPa) at 130 °F (54.4 °C), in which case the regulator would read 89 psi (615 kPa)
iii) any flammable liquid with an absolute pressure above 40 psi (275.8 kPa) at 100 °F (37.8 °C).
This definition comes from CGA P-1-1991, "Safe Handling of Compressed Gases in Containers". (August 11, 1999)

(2) For the purpose of subsection (1), Compressed Gas Association standard CGA P-1-1991, "Safe Handling of Compressed Gases in Containers", is presumed to indicate the required standard of reasonable care, unless an employer proves that this is not reasonably practicable in a particular circumstance.

See Appendix A for a summary of this standard. (May 7, 1999)

This standard applies in all cases, unless the employer proves there is a gross disproportion between the benefit of observing the standard and the cost, in time, trouble and money, of observing the standard. (August 11, 1999)

The standard applies to portable containers only (April 11, 2000), the term container includes cylinders. (April 11, 2000)

The standard allows indoor storage of up to 309 pounds per cylinder (July 20, 2001)

Liquid Nitrogen, beyond the general precautions of the standard, would be covered in section 4.6 of the standard dealing specifically with Cryogenic Liquified Gases (Jan 1, 2004)

46 **(1)** An employer shall ensure that a regulator, automatic reducing valve, gauge, hose line or other equipment provided for use with a compressed gas cylinder and a particular gas or group of gases, is not used on a compressed gas cylinder containing a different gas unless this use is approved by the supplier of the regulator, automatic reducing valve, gauge, hose line or other equipment.

(2) An employer shall ensure that a compressed gas cylinder has

(a) connections to piping, regulators and other components that are kept tight to prevent leakage; and

(b) valves that are kept closed at all times, whether the cylinder is charged or empty, except where

(i) gas is flowing from the cylinder,

(ii) the gas in the cylinder is maintaining pressure in a supply line, or

(iii) the cylinder is on stand-by during and between operations using gas.

(3) An employer shall ensure that hose lines for conveying flammable gas or oxygen from supply piping or compressed gas cylinders to torches have threads designed in compliance with Compressed Gas Association standard ANSI/CGA V-1-1994, "American National Standard/Compressed Gas Association Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections".

Portable compressed gas cylinders

47 (1) In this Section and in Sections 48 and 49, "portable compressed gas cylinder" means a cylinder having a water capacity of 450 kg or less that contains or is intended to contain a compressed or liquefied gas.

450 kg equals 450 litres or 100 imperial gallons. (May 7, 1999)

(2) Subject to the *Fire Prevention Act*, an employer shall ensure that a portable compressed gas cylinder is stored

(a) in a well-ventilated storage area where the temperature does not exceed 52°C;

52°C is 125.6°F (May 7, 1999)

(b) with cylinders grouped by types of gas and the groups arranged to take into account the gases contained;

(c) with full and empty cylinders separated;

The separation need not be in separate rooms. They must be separated enough that it is unlikely that a full and empty cylinder shall be confused. (May 7, 1999)

(d) at a safe distance from all operations that produce flames, sparks or molten metal or result in excessive heating of the cylinder;

(e) securely; and

Compatible portable compressed gas cylinders shall be secured, so as to prevent it (them) from falling over, by chains or straps or other equivalent means (June 29, 1999). "Nesting" of compressed gas cylinders is an acceptable means of securing cylinders at the gas manufacturers' facilities and distributors' warehouse; **it is not acceptable** at the users' facilities (July 20, 2001)

(f) with protective devices in place.

"Protective devices" includes caps used on cylinders. (June 29, 1999).

(3) Subject to the *Fire Prevention Act*, an employer shall ensure that a portable compressed gas cylinder is

(a) not exposed to corrosive materials or corrosion-aiding substances; and

(b) protected from falling and from having objects fall on it.

(4) An employer shall prominently post in a storage area for portable compressed gas cylinders the names of the gases stored and signs prohibiting smoking.

48 **(1)** No person shall

(a) roll a portable compressed gas cylinder on its side,

(b) subject a portable compressed gas cylinder to rough handling; or

"Rough handling" includes:
-throwing, dropping, dragging (June 29, 1999).

(c) move a portable compressed gas cylinder with a lifting magnet.

(2) Where appropriate lifting mechanisms have not been provided on a portable compressed gas cylinder, an employer shall ensure that suitable cradles or platforms for holding the cylinder are used for lifting it.

This section is not meant to say that "lecture bottles" or similar small cylinders cannot be carried by hand. (May 7, 1999)

49 An employer shall ensure that a portable compressed gas cylinder is

(a) securely fastened and in an upright position during transportation, unless designed for transport in another orientation;

(b) has a protective cap attached or located on the cylinder or the cylinder is positioned in a manner that will provide an equivalent level of safety during transportation; and

(c) is transported in a manner that will prevent damage to the cylinder and its components.

Refuelling

50 An employer shall adopt an adequate refuelling procedure for equipment that has an internal combustion engine and an employee shall follow the procedure when refuelling equipment.

This section applies to any piece of equipment that has an internal combustion engine ranging from chain saws to road working equipment. (June 29, 1999).

Part 6 - Lock-out

Interpretation, application, control and energizing

51 (1) In this Part,

(a) "equipment" includes

(i) pipes for transporting a material, and

(ii) hydraulic or pneumatic lines;

(b) "lock-out device" means the device that secures the isolation of the energy source of a locked out machine, equipment, tool or electrical installation;

A lock-out device need not be specifically manufactured for that purpose. (August 5, 1999).

(c) "lock-out location" means the location of a lock-out device;

(d) "lock-out tag" means a tag that

(i) is installed at a lock-out location,

(ii) has words directing a person not to start or operate the machine, equipment, tool or electrical installation,

(iii) identifies the person who has performed a lock-out, and

(iv) does not readily conduct electricity; and

(e) "zero energy state" means a condition in which a machine, equipment, tool or electrical installation is rendered incapable of spontaneous or unexpected action or otherwise releasing kinetic or potential energy.

When a machine is locked out it is impossible to energize it in any way - whether directly through an on/off switch or indirectly through a main power switch. (August 5, 1999)

(2) This Part applies to a machine, equipment, tool or electrical installation that is erected, installed, assembled,

started, operated, handled, stored, stopped, inspected, serviced, tested, cleaned, adjusted, maintained, repaired or dismantled .

This includes unjamming and tool changes. (June 29, 1999).

(3) An employer shall ensure that, in addition to any normal start and stop control mechanism, a machine, equipment, tool or electrical installation has a means of isolating all sources of energy to the machine, equipment, tool or electrical installation that is

(a) accessible when needed by an employee; and

(b) readily identifiable.

"isolating" means to remove, disconnect, or render inaccessible. Examples may include
-disconnecting the circuit for electrical equipment
-disconnecting or covering (rendering inaccessible) the source of air pressure for pneumatic equipment. (August 5, 1999).

(4) An employer shall ensure that where a person may be exposed to a hazard by the energizing of a machine, equipment, tool or electrical installation, or any part of it, a de-energized machine, equipment, tool or electrical installation, or any part of it, is energized

(a) only in accordance with an applicable written procedure established by the employer; and

(b) only after all persons are clear of the hazardous area and have been instructed to remain clear.

A person is exposed to a hazard anytime a machine could be started without the knowledge of the person who is carrying out an activity referenced in sub-section (2). (June 29, 1999).

Lock-out procedure

52 (1) Where work is performed on a machine, equipment, tool or electrical installation, and the work is hazardous to a person in the workplace if the machine, equipment, tool or electrical installation is or becomes energized, an employer shall ensure that

(a) the work is done in accordance with a written lock-out procedure established by the employer;

(b) no person works on the machine, equipment, tool or electrical installation until the machine, equipment, tool or electrical installation

  (i) is put in and maintained at a zero energy state,

  (ii) is locked out, and

  (iii) has a lock-out tag at each lock-out location; and

(c) a competent person verifies that the requirements of clauses (a) and (b) have been complied with and tests to determine that the machine, equipment, tool or electrical installation is in a zero energy state.

Note: verification need not be done by an independent person. (April 11, 2000).

Note: a computer lock-out is acceptable as long as it meets the requirements of clause 2s. (April 11, 2000).

1(A) No employee shall perform work on a machine, equipment, tool or electrical installation in the circumstances described in subsection (1) unless the requirements of clause 52(1)(b) are met.

(2) The written lock-out procedure referred to in subsection (1) shall include

(a) provision for complying with the requirements of subsection (1);

(b) the method of notifying a person in the work area of safe conditions for work after a lock-out has been completed;

(c) the method of determining that all persons near the locked out machine, equipment, tool or electrical installation are clear of the hazardous area and have been instructed to remain clear before the machine, equipment, tool or electrical installation, or any part of it, is energized; and

(d) the method of energizing the machine, equipment, tool or electrical installation.

53 **(1)** No person other than the person who installed it shall remove a lock-out device or a lock-out tag on a machine, equipment, tool or electrical installation.

(2) Despite subsection (1), where reasonable attempts have been made to contact the person who locked out the machine, equipment, tool or electrical installation and that person is not available,

(a) in a serious emergency, a person who has determined that it is safe to energize the equipment may remove a lock-out device or a lock-out tag; or

(b) a competent person who

  (i) is designated in the written lock-out procedure, and

  (ii) has determined that it is safe to energize the equipment,

may remove a lock-out device or a lock-out tag.

"reasonable attempts" includes: a physical search of the workplace; calling the employee at home, and any other contact number that is available (August 5, 1999).

"Serious emergency" would be when:
i) a person, or persons', health or safety may be adversely affected, ii) there may be significant damage to equipment or property, or iii) there may be significant economic loss before the normal unlocking procedure occurs. (April 11, 2000).

54 Despite subsection 51(4) or Section 52, where work is performed on a machine, equipment, tool or electrical installation, and the work is hazardous to a person in the workplace if the machine, equipment, tool or electrical installation is or becomes energized, and the requirements of subsection 51(4) or Section 52 are

(a) inappropriate for the work to be performed or inadequate for the protection of persons at the workplace; or

Examples of (a) may include working on live power lines without shutting off the power to the line, and tapping into pressurized lines. (April 11, 1999).

(b) not reasonably practicable where the electrical installation is used for the generation or transmission of electricity,

an employer may substitute for the requirements of those provisions an alternative adequate written procedure that specifies personnel responsibilities, training and equipment requirements and the details for carrying out the work in a manner that will ensure the safety of all person who may be exposed to a hazard arising from the work.

See clause 9(2)(a) for information on training and associated costs (December 14, 2000)

Part 7 - Hoists and Mobile Equipment

General provisions

55 An employer shall ensure that a hoist, industrial lift truck or powered mobile equipment is erected, installed, assembled, started, operated, used, handled, stored, stopped, inspected, serviced, tested, cleaned, adjusted, maintained, repaired, modified and dismantled in accordance with the manufacturer's specifications, or the specifications certified by an engineer.

56 An employer shall ensure that a hoist, industrial lift truck or powered mobile equipment

(a) is operated by a designated competent person;

(b) has gears and moving parts securely guarded by adequate means where necessary to prevent a hazard to a person in the workplace;

(c) has any load on it adequately secured where necessary to prevent a hazard to a person in the workplace; and

(d) is provided with safe means of access and exit from the operator's position and any passenger's position.

Officers determine competency by various criteria including: education, training, knowledge, experience and any required certifications (ie. P.Eng.) (see definitions for complete list). Certification may be taken by the officer as supporting evidence for competence.

Section 3(1) of the *Crane Operators and Power Engineers Act* reads as follows: "3(1) This Part *(i.e. crane operator certification)* does not apply to (d) a worker hoist or material hoist within the meaning of the regulations made pursuant to the *Occupational Health and Safety Act.*"

Note the OSGR does not define or use the terms "worker" or "material" hoist. Thus the exemption at 3(1)(d) has no effect as presently written.

The OHS Act Reference Guide sub-section 13(1)(c) notes that certification papers/tickets are not required unless specifically noted in the Act or the regulations enforced/administered by the OH&S Division.

"Powered mobile equipment" means self-propelled; if the equipment is not self propelled or a hoist or industrial lift truck the operator does not need to be "designated" - however, clause 85(a) requires they still be competent to use the equipment (Jan 1, 2004)

Signaller

57 (1) An employer shall designate one or more competent persons as a signaller to direct the safe movement of a load, hoist, industrial lift truck or powered mobile equipment where the operator of that hoist, industrial lift truck or powered mobile equipment

(a) does not have an adequate view of the load;

(b) does not have a clear view of the route the load is to take;

(c) is not able to see clearly around the equipment when moving and has not taken measures sufficient to ensure that no person is exposed to a hazard as a result of the movement of equipment;

(d) is not able to see clearly where the hoist or its load may encroach the minimum distance specified in Section 126 or a hoist is positioned closer than the length of its boom to an overhead energized power line or power line equipment; or

"Length of its boom" refers to the actual length to which the boom is extended at any particular time. It does not automatically refer to the maximum legth of the boom. (April 11, 2000).

(e) is causing the equipment to move under its own power from one location to another and the situation creates a hazard in the workplace.

(2) A signaller shall

(a) be readily identifiable to the operator;

(b) direct the movement of a load or equipment by a well understood distinctive code of hand signals or another effective communication system;

The standards CSA Z150-1974: "Safety Code for Mobile Cranes" and Supplement No. 1-1977 to CSA Standard Z150-1974: "Safety Code for Mobile Cranes" and CSA Z248-1975: "Code for Tower Cranes" referenced in Section 72 of this regulation contain a set of hand signals. Any set of signals that is understood by the operator and signaller would be acceptable. (August 6, 1999).

"Another effective communication system" may be two-way electronic communication. (August 6, 1999).

(c) warn the operator each time

  (i) any part of the hoist or its load may encroach on the minimum distance specified in Section 126, or

  (ii) the hoist is positioned closer than the length of its boom

from an overhead energized power line or power line equipment; and

(d) obtain the assistance of another signaller if all or part of the view of the load or route is obstructed from both the signaller and the operator.

(3) An operator of a hoist, industrial lift truck or powered mobile equipment in a situation referred to in subsection (1) shall move a load only on a signal from a signaller.

Safety equipment and precautions

58 An employer shall ensure that a mobile crane, industrial lift truck or powered mobile equipment is equipped with

- (a) an audible back-up alarm that
  - (i) operates automatically when the vehicle is in reverse gear, and
  - (ii) is clearly audible above the background noise at the workplace,

"automatically" means a self activating mechanism once the vehicle is placed in reverse; it does not require the driver to take any action. (April 11, 2000).

or that another means of protection or warning that provides an equivalent level of safety is used;

A competent signaller would be considered an equivalent level of safety. (April 11, 2000).

- (b) a manually operated horn, unless such a horn was not installed at the time of manufacture;
- (c) adequate front and rear lights when the equipment is used after dark or in dimly lit areas;

The function of these lights is to allow drivers to see where they are going; 360 degree warning lights do not accomplish this objective. (April 11, 2000).

- (d) an adequate braking system; and
- (e) a screen, shield, grill, deflector, guard or other adequate protection for the operator, where the operator may be exposed to the hazard of flying or intruding objects.

59 An employer shall ensure that a hoist or powered mobile equipment that is equipped with outriggers or stabilizers is operated with the outriggers or stabilizers engaged, unless the manufacturer's specifications permit otherwise.

60 An employer shall ensure that a hoist, industrial lift truck or powered mobile equipment is not altered in such a way as to render ineffective a safety device or control, except where the change has been certified in writing by the manufacturer or an engineer to afford protection equal to or greater than the protection afforded by the original safety device or control.

An engineer certification will require the engineer's stamp. (April 11, 2000).

61 An employer shall take adequate precautions to ensure that a hoist, industrial lift truck or powered mobile equipment does not tip or roll over.

Overhead protection

62 (1) Where the operator of powered mobile equipment is exposed to a hazard from falling objects, an employer shall ensure that the powered mobile equipment is equipped with a protective structure adequate for the conditions in which the equipment is being used and that meets the requirements of the applicable SAE standard listed below or that is certified by an engineer or the manufacturer to provide equivalent or better protection:

Unless there is clearly no hazard, powered mobile equipment engaged in construction, mining, and forestry work is required to be equipped with overhead protection. (August 6, 1999).

Note: the hazard under consideration in 62(1) is the kinetic energy from a falling object; i.e a "striking hazard". Falling objects such as sand, and sawdust are engulfment hazards and do not trigger the requirement for falling object protective structures (September 15, 2004)

(a) SAE J167 APR92, "Overhead Protection for Agricultural Tractors - Test Procedures and Performance Requirements";

Look for SAE certification. (May 7, 1999)

(b) International Organization for Standardization (ISO) 3449:1992, "Earth-moving machinery – Falling-object protective structures – Laboratory tests and performance requirements";

Look for ISO certification. (May 7, 1999)

(c) SAE J397 OCT95, "Deflection Limiting Volume - Protective Structures Laboratory Evaluation";

This standard just defines a series of terms. It sets no performance criteria itself. (May 7, 1999)

(d) SAE J1042 JUN93, "Operator Protection for General-Purpose Industrial Machines"; or

(e) SAE J1084 APR80, "Operator Protective Structure Performance Criteria for Certain Forestry".

Look for SAE certification (May 7, 1999)

(2) An employer shall ensure that modifications, alterations or repairs made to a falling objects protective structure that affect the structural integrity of the structure meet the requirements of this Section and that the designing agency, the installing agency or an engineer certifies that modifications, alterations or repairs meet the requirements of this Section.

(3) An employer shall ensure that welding on a falling objects protective structure that affects the structural integrity of the structure is performed by a designated competent person.

The designated competent person need not be a trades person. (August 6, 1999).

Rollover protection

63 **(1)** An employer shall ensure that, where reasonably practicable, powered mobile equipment and industrial lift trucks manufactured on or after January 1, 1974, are equipped with rollover protective structures that meet the minimum safety requirements of the following standards:

(a) CSA standard B352.0-95, "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial and Mining Machines - Part 1: General Requirements", or is certified by an engineer or the manufacturer to provide equivalent or better protection;

(b) where applicable, CSA standard B352.1-95 (R1999), "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines - Part 2: Testing Requirements for ROPS on Agricultural Tractors", or is certified by an engineer or the manufacturer to provide equivalent or better protection; and

(c) where applicable, CSA standard B352.2-95 (R1999), "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines - Part 3: Testing Requirements for ROPS on Construction, Earthmoving, Forestry, Industrial, and Mining Machines", or is certified by an engineer or the manufacturer to provide equivalent or better protection.

Unlike the requirement for overhead protection, which is required where the operator of powered mobile equipment is exposed to a hazard from falling objects, rollover protection is required where reasonably practicable. Rollover protection is required unless the employer can justify that it is not reasonably practicable. (June 25, 1999).

Section 63 does not require rollover protective structures where their use would be reasonably impracticable. The decision as to reasonable practicability is made by the user of the tractor, **not** the supplier. (July 20, 2001)

The standards are limited in scope to vehicles over 700 or 800 kg (depending on which standard used), therefore would not apply to most lawn tractors (March 1, 2004)

According to the standard:
- all ROPS shall have a label showing:
  - manufacturer
  - ROPS identification number
  - CSA standard to which the ROPS was certified
  - machine make and models for which the ROPS was designed
  - maximum machine mass for which the ROPS was certified
- all machines with ROPS shall have seat belts
- ROPS shall have at least 2 exits (May 7, 1999)

"Manufacturer" means to produce goods in large numbers; therefore, a person making ROPS in their 'backyard' is not a manufacturer and cannot certify their ROPS. However, they would still be a considered a "supplier" under the OH&S Act and are accountable under that statute (July 20, 2001)

"Rollover protective structures designed to the Society of Automotive Engineers standard SAE J1040, "Performance Criteria for Rollover Protective Structures (ROPS) for Construction, Earthmoving, Forestry, and Mining Machines" are acceptable in all cases.

Rollover protective structures designed to either the Society of Automotive Engineers standard SAE J1194, "Roll-Over Protective Structures (ROPS) for Wheeled

Agricultural Tractors" and SAE standard J2194, "Roll-Over Protective Structures (ROPS) for Wheeled Agricultural Tractors" are also acceptable **PROVIDED** that the verification test used was **NOT** the "Static Test at -18^0 C for Non-ROPS material" (see Figure 1 of either standard). If the "Static Test at -18^{0}C for Non-ROPS material" was used to test the ROPS, the certification will **NOT** be accepted.

Due to their failure to meet all the safety requirements of the CSA standards, rollover protective structures designed to:
- American Society of Agricultural Engineers standard S383.1-Dec99, "Roll-Over Protective Structures (ROPS) for Wheeled Agricultural Tractors
- United States Occupational Safety and Health Administration regulation 1926.1001, "Minimum Performance Criteria for Rollover Protective Structures for Designated Scrapers, Loaders, Dozers, Graders and Crawler Tractors" will **NOT** be accepted." (December 8, 2000)

(2) Where reasonably practicable, an employer shall ensure that powered mobile equipment or industrial lift trucks manufactured before January 1, 1974 are equipped with rollover protective structures that meet the requirements of subsection (1) or

(a) a rollover protective structure and supporting attachments are designed, fabricated and installed in such a manner to support not less than twice the weight of the equipment, based on the ultimate strength of the material and integrated loading of the supporting members with the resultant load applied at the point of impact;

(b) there is a vertical clearance of 1320 mm between the deck and the rollover protective structure at the access openings; and

1320 mm = approximately 51.5 in

(c) the rollover protective structure and supporting attachments referred to in clause (a) are certified as meeting the requirements of clause (a) by the manufacturer of the rollover protective structure, the installing agency or an engineer.

(3) An employer shall ensure that modifications, alterations or repairs made to a rollover protective structure that affect the structural integrity of the structure meet the requirements of this Section and that the designing agency, the installing agency or an engineer certifies that modifications, alterations or repairs meet the requirements of this Section.

64 An employer shall ensure that welding on a rollover protective structure that affects the structural integrity of the structure is performed by a designated competent person.

The designated competent person need not be a trades person. (August 6, 1999).

65 **(1)** An employer shall ensure that powered mobile equipment and industrial lift trucks that have been fitted with rollover protective structures have

(a) seat belts for the operator and passengers that comply with or exceed the applicable SAE standard listed below:

(i) SAE J386 NOV97, "Operator Restraint System for Off-Road Work Machines", or

(ii) SAE J800 JUN94, "Motor Vehicle Seat Belt Assembly Installation"; or

(b) where the wearing of seat belts is not reasonably practicable, restraining devices such as shoulder belts, bars, gates, screens or other similar devices designed to prevent the operator and passengers from being thrown outside the rollover protective structure.

(2) An operator of and passengers on powered mobile equipment or an industrial lift truck shall use the seat belts or restraining devices referred to in subsection (1) while the equipment is in motion.

If the employer has decided installing a ROP is not reasonably practicable as per 63(1), there is no requirement for a seat belt and therefore no requirement to wear one (Feb. 1, 2004)

Glass

66 An employer shall ensure that glazing or rigid plastic materials used as part of an enclosure for a cab, canopy or rollover protective structure on a hoist, industrial lift truck or powered mobile equipment is adequate in the circumstances where it is used, and is immediately replaced if it presents a hazard, including permanent interference with visibility.

Precautionary arrangements

67 **(1)** Unless otherwise authorized by an enactment, no person shall operate an industrial lift truck or powered mobile equipment with passengers on the truck or equipment, unless the manufacturer's specifications for the truck or equipment state that truck or equipment is designed to accommodate them safely.

"Unless otherwise authorized by an enactment" means authorized by another Act or regulation. (April 11, 2000).

In enforcing this subsection, the officer should consider the fire fighting equipment 'provided' as including that which may be located in the general vicinity that the powered mobile equipment or industrial lift truck is operating. January 31, 2002.

(2) An employer shall ensure that powered mobile equipment and industrial lift trucks that have an internal combustion engine are provided with fire protection equipment adequate for the hazards of the equipment or vehicles.

Passenger vehicles are not included in the definition of powered mobile equipment and therefore do not require fire extinguishers - note fire extinguishers may be placed in passenger vehicles they are just not required by the regulations. Jan 1, 2004

This clause stipulates "internal combustion engine" as requiring fire protection equipment - electric forklifts would not fall into this category (Feb. 1, 2004)

(3) An employer shall

(a) ensure that mirrors or other devices are installed and maintained at blind intersections where there may be a danger of a collision between an industrial lift truck or powered mobile equipment and another object or a person; or

The mirror or device is not to be installed on the mobile equipment. (August 6, 1999).

(b) adopt a written procedure that provides an equivalent level of safety.

Visibility

68 Where work with a hoist, industrial lift truck or powered mobile equipment is carried out in an area where dust may create a hazard to a person in the workplace because of poor visibility, an employer shall take steps to reduce the amount of dust in the air so as to protect a person from the risk of injury.

Operating precautions

69 An operator of a mobile crane, where applicable, an industrial lift truck or powered mobile equipment shall

(a) not set equipment in motion until all air and hydraulic pressures are fully built up at specified operating pressures;

(b) when leaving the equipment unattended

(i) park it on level ground, if reasonably practicable,

(ii) set the parking brake,

(iii) lower the blades, bucket or other attachment or safely block the attachment,

(iv) where applicable, disengage the master clutch, and

(v) shut off the engine or take other precautions to ensure the equipment is not inadvertently set in motion;

(c) not carry containers of gasoline, diesel oil or other flammable substances, classified as Class B substances under the *Hazardous Products Act* (Canada), in the part of the equipment where a person rides; and

(d) ensure that there are no loose articles that may present a hazard in the part of the equipment where a person rides.

"Unattended" means the operator cannot see the controls or is unable to respond without delay to a possible emergency. (April 11, 2000).

70 **(1)** An employer shall ensure that a hoist, industrial lift truck or powered mobile equipment that has wire ropes, drums and sheaves is inspected

(a) visually on a daily basis by the operator of the equipment; and

(b) visually and manually by a designated competent person on a weekly basis.

(2) An employer shall ensure that, where a person works under a hoist, industrial lift truck, or powered mobile equipment that is raised from the ground, the equipment is provided with blocking or other adequate means of support in case the means of lifting the equipment fails.

Two independent systems must be used to support the equipment where a person is working under a hoist. For example: where a person is working under an automotive lift, this section would require the use of blocks in the event the lifting mechanism failed. (April 11, 2000).

71 Where repair or maintenance work is carried out at the point of articulation on an articulated truck, front end loader or other articulated equipment, an employer shall ensure that lock bars or an equivalent measure is used to prevent movement of either end of the truck, loader or equipment.

Articulated equipment may include some types of:
-skidders
-front-end loaders
-dump trucks
-lawn mowers
(April 11, 2000).

Hoists

72 **(1)** Subject to subsection (2), an employer shall ensure that a hoist is designed, installed, erected, examined, inspected, tested, operated and maintained by a competent person, in accordance with the applicable CSA or ANSI standard listed below:

(a) CSA standard B167-96, "Safety Standard for Maintenance and Inspection of Overhead Cranes, Gantry Cranes, Monorails, Hoists, and Trolleys";

See Appendix B for a summary of this standard. (May 7, 1999)

The standard covers the detailed electrical design for electric cranes, hoists and monorails. Such details would not normally be obvious to the average Officer during an inspection. (May 7, 1999)

(b) CSA standard C22.2 No. 33-M1984(R1992), "Construction and Test of Electric Cranes and Hoists";

The standards cited in (a) and (b) do not require load testing after repairs - see 73(9) (Feb. 1, 2004)

(c) CSA standard Z150-1998, "Safety Code for Mobile Cranes";

See Appendix C for a summary of this standard. (May 7, 1999)

(d) CSA Standard Z248-1975, "Code for Tower Cranes";

See Appendix D for a summary of this standard. (May 7, 1999)

(e) ANSI standard ANSI/ALI ALCTV-1998, "Automotive Lifts - Safety Requirements for Operation, Inspection and Maintenance";

See Appendix E for a summary of this standard. (May 7, 1999)

(f) ANSI standard ANSI/ALI ALOIM-1994, "American National Standard for Automotive Lifts - Safety Requirements for Operation, Inspection and Maintenance".

(2) Despite subsection (1), a "crane inspector" described in the standard referred to in clause (1)(a) shall not require 10 000 hours of experience.

73 (1) In this Section and Section 74, "rated load" means the maximum load that a hoist is designed to lift or the revised maximum load that a hoist can lift in accordance with subsection (9) or (10).

(2) Subject to subsections (3), (9) and (10), an employer shall obtain a statement of the rated load of a hoist from the manufacturer of the hoist.

(3) Where the statement referred to in subsection (2) cannot be obtained, an employer shall obtain a statement of the rated load of the hoist from an engineer.

Where an engineering certification or statement is required, the certification or statement should be stamped by the engineer and clearly state the engineer's opinion on the issue at hand. Where the certification or statement contains a qualifier or limitation, the employer should create a safe work procedure or equivalent document to ensure the limitation or qualifier is followed. (April 11, 2000).

(4) In addition to any inspection under Section 72, an employer shall ensure that

(a) a competent person inspects a hoist at least once a year;

(b) where the hoist is a mobile or overhead crane with a capacity of greater than 5 t, a certificate from an engineer is obtained on an annual basis with respect to the mobile or overhead crane; or

5t = approximately 11,000 lbs

For mobile and overhead cranes with a rating not exceeding 5 tonnes, a certificate from an engineer is not required, but the annual inspection under S.73(4)(a) is still required. (June 21,1999)

(c) where the hoist is a tower crane, a certificate from an engineer is obtained with respect to the tower crane

(i) prior to the tower crane being put into service and each time it is erected, and

(ii) once during each year of operation.

(5)	**An inspection or a certification required by subsection (4) shall confirm that a hoist has a rated load identified and that no component will fail within its rated load.**	**"No component will fail...." means that at the time of the inspection or certification that no component will fail if the crane is subjected to its maximum rated load. (April 11, 2000)**
(6)	**The competent person inspecting a hoist under clause (4)(a) and an engineer certifying a mobile or overhead crane under clause (4)(b) or a tower crane under clause (4)(c) shall perform the appropriate tests to ensure that the hoist is capable of lifting its rated load, including, where appropriate, a running test, load test, deflection test and brake test.**	**This section does not impose any requirements for load testing after repairs to the hoist - see clause 9 (Feb. 1, 2004).** **There is no mandatory requirement for an annual load test (March 1, 2004)** **The competent person undertaking the inspections will determine whether the specified tests are required (Feb. 1, 2004)**
(7)	**An employer shall post a legible statement of the rated load referred to in subsection (2) or (3) on a hoist so that the operator of the hoist is able to see it when operating the hoist.**	
(8)	**The employer shall ensure that an operator of a hoist has sufficient information to determine the load that the hoist is capable of hoisting safely under any operating condition.**	**This is usually in the form of a load chart. The chart gives the maximum safe lifting capacity under applicable set-up conditions. (June 21, 1999).**
(9)	**Where part of a hoist is modified, extended, altered or repaired so as to potentially affect the rated load of the hoist, an employer shall obtain a revised statement of the rated load of the hoist from the manufacturer, if the manufacturer performed the work, otherwise from an engineer, and post it on the hoist in the manner described in subsection (7).**	
(10)	**Where an employer believes that a reduction in the rated load is warranted or has been informed by the manufacturer of the hoist or an engineer that a reduction in the rated load is warranted, the employer shall** **(a) obtain a revised statement**	

of the rated load of the hoist from the manufacturer or an engineer;

(b) reduce the rated load of the hoist to a revised level certified as adequate by the manufacturer or an engineer; and

(c) remove the statement of rated load from the hoist and post the revised statement of rated load on the hoist in the manner described in subsection (7).

(11) Where the employer has obtained a revised statement of the rated load of a hoist pursuant to subsections (9) or (10), the employer shall provide sufficient information to the operator of the hoist to enable the operator to determine the load that the hoist is capable of hoisting safely under any operating condition.

74 (1) Subject to subsection (2), the operator of a hoist shall not subject the hoist to a load in excess of its rated load.

Some factors which may affect (reduce) the rated load are:
-boom radius
-boom angle
-use of outriggers
-quadrant of operation
-soil stability
-wind loading
(April 11, 2000)

(2) At the time that tests are performed for purposes of an inspection or certification, the person inspecting the hoist may cause the hoist to be subject to a load in excess of its rated load, but not in excess of the safety factor identified by

(a) the applicable standard in Section 72 or the manufacturer's specifications; or

See applicable standards for load test specifications. (June 21, 199).

(b) where there is no standard or manufacturer's specifications, the specifications certified by an engineer.

75 (1) In addition to any inspections referred to in Sections 72 or 73, an employer shall ensure that a competent person visually inspects a hoist, including any safety devices, for defects that may affect the structural integrity of the hoist

(a) before it is put into service initially or after 1 month or more of disuse;

(b) once during every month of operation; and

(c) after any incident or repair, including contact with an energized utility line or equipment that may have damaged some part of the hoist or endangered any person.

(2) Where an inspection identifies a defect in a hoist that affects the safe operation of the hoist, an employer shall remove the hoist from service and repair it before it is put back into service.

(3) An employer shall maintain a record of

(a) each inspection of a hoist required under Sections 72 and 73, and subsection (1); and

(b) each repair potentially affecting the structural integrity of a component of a hoist that supports a load,

including the date, time, nature and results of the inspection or repair and the name of the person who performed the inspection or repair to a hoist.

See applicable standard for specifics of inspections. (June 21, 1999)

(4) Where limit switches and safety devices are installed on a hoist by the

manufacturer, an employer shall ensure that these switches and devices are maintained in adequate condition.

76 An operator of a hoist shall

(a) visually inspect the hoist on a daily basis before use to verify that it is in adequate working order;

See applicable standard for items to be inspected. (June 21, 1999)

(b) not carry a load over any person, except where

(i) it is not reasonably practicable to divert the traffic route of persons or use another lifting route, and

(ii) the employer has developed a written work procedure to provide adequate warning or information about the hazard to people at or near the work place;

(c) not leave a suspended load unattended; and

"Unattended" as per section 69(b). The regulation overrides CSA Z150-1998 "Safety Code for Mobile Cranes" which prohibits the operator from leaving the controls while the load is suspended. (August 6, 1999).

"Suspended load" includes any rigging or below-the-hook lifting devices that are left attached on an unattended hoist. In order to leave rigging attached and unattended a deviation would be required. (July 20, 2001)

(d) where an uncontrolled swing or uncontrolled rotation of a load may endanger the health or safety of a person, ensure that a guide rope or other adequate means is used to stabilize the load.

Mobile cranes

77 An employer shall ensure that a mobile crane has

(a) installed and maintained in an adequate condition a device that warns the mobile crane operator when continued movement may cause the load attached to a mobile crane to strike the upper sheaves of the mobile crane; and

This device is commonly known as an Anti-Two-Block device and is required on both hydraulic and conventional mobile cranes as per section 3.3.6 of CAN/CSA - Z-150-1998. (June 21, 1999)

(b) if equipped with a boom that is not articulating, a boom angle indicator.

The indicator must be calibrated, legible and graduated so the operator is able to gain a correct reading to within 1degree while seated at the control station. (April 11, 2000).

78 An employer shall ensure that barriers or equivalent means are used to prevent a person from entering within the swing radius of the body of the mobile crane where a mobile crane is being operated in an area where the clearance between any obstruction and the swing radius of the body of the mobile crane creates a hazard.

Note CAN/CSA-Z-150-1998, clause 5.4.1.5 requires barriers or other effective means to prevent entry to the obstructed area where the mobile crane is closer than 0.6m (approximately 2 ft) to any obstruction. (June 21, 1999).

79 While a mobile crane is moving from one location to another under its own power, no operator shall permit the boom to swing in an uncontrolled manner.

This section applies to travel with or without a load. (August 6, 1999).

Rigging hardware

80 **(1)** In this Section, "rigging hardware" means a chain, cable, webbing, bucket, grapple, hook, ring, sling or other device used to attach a load to a hoist.

(2) Every inspection required to be performed under this Section shall be performed by a competent person

(3) Subject to subsection (4), an employer shall ensure that rigging hardware is constructed, installed, operated, inspected and maintained in accordance with the applicable ASME standard listed below:

There is no requirement to have an engineer inspect a crane supported work platform (Jan 1, 2004)

(a) ASME B30.9-1996, "Slings";

See Appendix G for a summary of this standard. (May 7, 1999)

Slings carried under rotorcraft (helicopters) are still considered slings and are covered by the provisions of this standard - unless the load is jettisonable from outside the craft; these slings being covered by ASME B30-12 "Handling Loads Suspended from Rotorcraft" (Feb 1, 2004)

(b) ASME B30.10-1993, "Hooks"; or

See Appendix H for a summary of this standard. (May 7, 1999)

(c) ASME B30.20-1999, "Below-the-Hook Lifting Devices".

See Appendix I for a summary of this standard. (May 7, 1999)

(4) Where none of the standards referred to in subsection (3) apply, an employer shall ensure that the rigging hardware complies with an adequate design certified by an engineer.

(5) Where rigging hardware is commercially manufactured in addition to the requirements of subsection (3) or (4), an employer shall ensure that rigging hardware is constructed, installed, operated, inspected and maintained in accordance with the manufacturer's specifications.

(6) In addition to any inspection required under subsection (5), an employer shall ensure that a person inspects the rigging hardware before each use to ensure that no defect exists that may affect its structural integrity.

(7) In addition to the requirements of subsections (5) and (6), an employer shall ensure that a person inspects the rigging hardware

(a) before it is put into initial service or after one month or more of disuse; and
(c) once during every year that it is in operation.

(8) Where the competent person conducting an inspection referred to in subsections (3), (5), (6) or (7) identifies a defect that may affect the structural integrity of the rigging hardware, an employer shall ensure that the rigging hardware is removed from service until such time as it is repaired.

(9) An employer shall maintain a record of

(a) inspections referred to in subsections (3), (5), and (7); and

(b) repairs to rigging hardware.

(10) The record referred to in subsection (9) shall include the date, time, nature and results of the inspection or repair and the name of the person who performed the inspection or repair.

(11) An employer shall identify the safe lifting capacity of rigging hardware

Typical defects in rigging hardware include nicks, cracks, breaks, gouges, stretch, bends, weld splatter, discolouration from extreme temperature exposure, and signs of exposure to corrosive substances in chemically active environments. (June 21, 1999).

Note: In many cases the standards referenced in 80(2) do not allow repairs. The rigging hardware in question must be replaced. See standards for specific information on the repair and/or replacement of rigging hardware. (June 21, 1999)

The labelling can be in any manner that is permanent, on the device in a permanent and clearly legible manner.

(12) An employer shall ensure that a person using rigging hardware receives adequate training and other information sufficient to ensure that they are knowledgeable about the capacity of the rigging hardware.

(13) An employer shall designate a competent person to use rigging hardware.

(14) Before a load is raised by a hoist, an employer shall ensure that a competent person ensures that the load is secured to the hoist in an adequate manner by means of appropriate rigging hardware.

clearly legible and is clearly understood by employees. Although the ASME standard requires detailed labels in many cases, this type of identification is only one option (June 21, 1999)

See clause 9(2)(a) for information on training and associated costs (December 14, 2000)

Industrial lift trucks

81 An employer shall ensure that an industrial lift truck

(a) is designed, installed, erected, examined, inspected, operated and maintained in accordance with the applicable ASME standard listed below, where applicable,

"Motorized Pallet Jack" - the standard called in this section defines a "low lift truck" as a "self-loading truck equipped with an elevating mechanism designed to raise the load only sufficiently enough to permit horizonatl movement. Popular types are low lift truck and pallet truck". If the motorized pallet jack meets this definition it is covered by the standard and would require the training listed in clause 4.19 of the standard. (June 19, 2000)

(i) ASME B56.1-1993, "Safety Standard for Low Lift and High Lift Trucks", or

See Appendix J for a summary of this standard. The standard requires that an operator training program be presented to new operators. The entire program is to be presented to operators new to the employer with no previous experience using the type of equipment they will operate at the workplace. Those operators who are new to the employer, but experienced in the operation of the type of equipment they will operate at the workplace, are to receive that portion of the training program dealing with issues related to the specific workplace. See the summary for a listing of the items to be covered in the training program. (August 6, 1999)

Work experience alone is not considered training for low and high lift trucks Jan 1, 2004

The standard require retraining when: new equipment is introduced; existing equipment is modified; operating conditions change; operator's performance is unsatisfactory - there is no time limit for retraining assuming none of the above triggers are activated (March 1, 2004)

(ii) ASME B56.6-1992, "Safety Standard for Rough Terrain Forklift Trucks";

See Appendix K for a summary of this standard. (May 7, 1999) The regulations require a competent person to operate rough terrain forklifts - the standard does require an operator training program, or retraining Jan 1, 2004

(b) in addition to any inspection required by clause (a), is inspected at the beginning of each shift in which it is used to ensure it is in a safe working condition.

There is no retention period specified by the regulations or the standards for records created by this clause - the employer may establish their own periods of retention (Feb. 1, 2004)

82 (1) An employer shall ensure that an industrial lift truck is not operated

(a) where propelled by an internal combustion engine, in a building or other enclosed structure where adequate ventilation, monitoring and record keeping practices are not carried out so as to eliminate the hazards from exhaust gases; and

The *Occupational Health Regulation* requires workplaces to meet the ACGIH Threshold Limit Values. (June 21, 1999)

In Part 13 of the Canadian Gas Association standard CAN/CGA - B149.2 - M95, "Propane Installation Code" the section on ventilation (clause 13.1.4 in the standard) may be used as an example of "adequate ventilation". (August 6, 1999).

(b) near an area containing airborne dust or flammable vapour in a concentration that may cause an explosion; or

(c) in a manner that may endanger a person.

(2) An employer shall ensure that where an industrial lift truck is operated

(a) in a one-way aisle, the width of the aisle equals at least the width of the vehicle or load being carried, whichever is wider, plus 600 mm; and

600 mm = approximately 2 ft. (April 26, 2000).

(b) in a two-way aisle, the width of the aisle equals at least twice the width of the vehicle or load being carried, whichever is wider, plus 900 mm.

900 mm = approximately 3 ft. (April 26, 2000).

(3) An employer shall ensure that an industrial lift truck that is propelled by propane

(a) has all engine and fuel components designed, assembled, examined, inspected, operated and maintained in accordance

- Standard covers off-highway vehicles only (August 6,1999)

- Propane tank must be filled outside away from sources of ignition

	with Part 13 of the Canadian Gas Association standard CAN/CGA - B149.2 - M95, "Propane Installation Code"; and	- Damaged parts must be removed from service immediately - Propane tank shall be mounted so as to protect it from heat and mechanical damage -Piping , tubing, hose and fittings shall comply with Can/CGA-B149.5-M95. - Propane container on a vehicle which is parked or being serviced indoors shall not be exposed to a temperature greater than 38°C - When serviced indoors, a propane system shall be parked at least 3 metres away from an open flame, any source of ignition or an open pit or drain (May 7, 1999)
(b)	has the components that are propane appliances and equipment repaired and maintained by a designated competent person.	

83 Where an industrial lift truck is used with a fork lift platform for lifting a person, the employer shall ensure that

(a) the industrial lift truck is inspected by an engineer at least once in the preceding 12 months to determine its adequacy for the purpose; and

(b) the engineer provides a written report certifying the results of the inspection.

An "order picker" is included in this section if it meets the requirements of clause 2(r) and uses a fork lift platform for lifting a person. (April 11, 2000).

General provisions

84 **(1)** An employer shall ensure that a machine that may be a hazard to the health and safety of a person at the workplace is erected, installed, assembled, started, operated, used, handled, stored, stopped, inspected, serviced, tested, cleaned, adjusted, maintained, repaired and dismantled in accordance with the manufacturer's specifications, or, where there are no manufacturer's specifications, the specifications certified by an engineer.

If the employer does not have and cannot obtain the manufacturer's specifications, either the employer must have equivalent specifications developed and certified by an engineer or the machine must not be used. Department of Labour officers are to issue orders if necessary to ensure that machines are not used without adequate specifications. (August 11, 1999).

Where either a manufacturer's or an engineer's specifications say "shall" and "must," the action is mandatory. Where the specifications say "may" or "should," the action is not mandatory unless circumstances dictate otherwise (August 11, 1999).

Where an action is necessary to occupational health and safety, the engineer's specifications must use mandatory words such as "shall" and "must." (August 11, 1999).

If the manufacturer's specifications do not allow for an adequate safeguard, ss 87(2) requires the employer to supplement the manufacturer's specifications in such a manner as to provide an adequate safeguard. Such a modification is not a violation ss 84(1) (October 10, 2003)

(2) An employer shall ensure that the maximum capacity, speed, load, depth of operation or working pressure or any other limitation set out in the manufacturer's specifications or in an engineer's specifications, for the operation of a machine, tool or equipment under the circumstances prevailing at the time of operation, shall not be exceeded.

(3) Where a defect is identified with a machine or supplies that affects the safe operation of the machine, an employer shall ensure that

(a) the machine is not operated until repaired; and

(b) until repaired or replaced, the machine and supplies are clearly identified as defective.

85 (1) An employer shall ensure that an operator of a machine or tool is a competent person.

(2) An employer shall ensure that a person responsible for maintaining a machine or tool is a competent person.

Contact with machines

86 (1) An employer shall ensure that adequate space is provided around a machine to ensure the safety of a person while the machine is being

(a) operated; or

(b) cleaned, adjusted, repaired or otherwise maintained.

(2) No person shall be near a rotating shaft, spindle, gear, belt or other possible source of entanglement

(a) while wearing any article of clothing or jewellery that in the circumstances presents a hazard to a person in the workplace; or

(b) with hair that is not confined closely to the head by suitable headwear.

"suitable headwear" includes any headwear that confines the hair to such an extent that it is unlikely to become entangled in any rotating shaft, spindle, gear, belt or other possible source of entanglement. (August 11, 1999).

Safeguards

87 (1) In this Section "safeguard" means a guard, shield, guardrail, fence, gate, barrier, safety net, wire mesh or other protective enclosure or device, but does not include personal protective equipment.

(2) Where a person may come in contact with a moving part of a machine or tool that may present a hazard to a person, an employer shall ensure that an adequate safeguard has been installed on the machine or tool to prevent contact.

(3) Despite subsection (2), an employer is not required to ensure that a safeguard is installed on a machine that is equipped with a device that stops the machine automatically before a person comes into contact with the moving parts.

(4) Despite subsection (2), where it is not reasonably practicable to use a safeguard on a cutting or shaping machine and there is a possibility of injury to a person, an employer shall

(a) ensure that a push block, push stick or other adequate protective device is used; and

(b) adopt a written procedure to ensure the safety of an operator of the machine.

This section allows the manufacturer's or engineer's specifications referred to in section 84 to be modified provided all other conditions are met (August 11, 1999).

(5) No person shall remove or render ineffective a safeguard on a machine, unless

(a) the removal or rendering is necessary to enable the cleaning, maintenance, adjustment, testing or repair of the machine,

(b) the machine is locked out; and

(c) the person replaces the safeguard and ensures the safeguard is functioning properly before leaving the machine.

(6) An employer shall ensure that adequate safeguards are installed on a machine where a person may be injured by a flying object from a machine.

(7) Where an object or material is to be applied to, fed into or supplied to a machine or tool and the object or material may shatter, splinter, vibrate, create a flying projectile or otherwise cause hazardous movement because it is not secure, an employer shall ensure that the object or material is held by a restraining device or other means of providing an equivalent level of safety.

(8) Where opening an access door exposes the moving parts of a machine or tool, an employer shall ensure, where reasonably practicable, that the access door is fitted with interlocks that

(a) prevent the access door from opening while the moving parts are in motion; or

(b) disconnect the power from the driving mechanism, causing the moving parts to stop immediately if the door is opened.

(9) Where it is not reasonably practicable to fit an access door with interlocks in accordance with subsection (8), an employer shall, in consultation with the committee or

representative, if any, develop an adequate written work procedure.

Starting and stopping machines

88 **(1)** An employer shall ensure that the operational controls on a machine are

(a) located and protected in such a manner as to prevent unintentional activation; and

(b) adequately identified so as to indicate the nature of each control mechanism.

(2) An employer shall ensure that a machine is designed with adequate means to prevent unintentional movements that may present a hazard to a person in the workplace.

(3) Where there is not a clear view of a machine or parts of it from the control panel or operator's station and the moving parts of the machine may endanger a person at the workplace when the machine is started,

(a) an employer shall ensure that an alarm system is installed that shall give an effective warning, with an adequate time delay, before the start-up of the machine so that a person at the workplace is made aware of the imminent start-up; and

There is no size limit on the machinery that requires the pre-start alarm; however, when both conditions a and b - there is not a clear view of a machine or parts of it from the control panel or operator's station **and** the moving parts may endager a person at the workplace when the machine is started - are met, the alarm system is required. (June 19, 2000)

There is no stipulation on what "adequate" time dely is. All cases will be different, but in considering whether the delay is adequate due regard should be given to: the maginitude of the hazard presented by the machine **and** the time it would take for a person receiving the warning to interpret the signal and react appropriately (June 19, 2000)

(b) where reasonably practicable, the person that is to start the machine or parts of it shall ensure that a visual inspection is done of the complete exterior of the machine or parts of it to ensure no person is endangered by the start-up.

(4) An employer shall ensure that an operator of a machine has unimpeded access in the operator's immediate work area to the means of stopping the machine.

89 Where a machine or tool that is not designed to operate unattended creates a hazard to a person in the workplace if it operates unattended, an employer shall ensure that the machine or tool is equipped with a "hold to operate" device that starts it when the device is held in a set position or stops it when the device is released.

This section refers to the use of what is commonly called a "dead man's switch" - a device which automatically shuts off a piece of equipment when pressure on a trigger or similar item is released. The switches can be found on such things as sand blasting nozzles where operation of the device without constant control by the operator would be hazardous.. (August 11, 1999).

Chain saws

90 An employer shall ensure that a chain saw complies with the CSA standard CSA Z62.1-95, "Chain Saws".

The standard sets requirements for several types and classes of saws. Type 1 is fuel powered; type 2 is electric. The classes are designed for the following workers:

1A	trained forestry workers
1B	certified tree service workers
1C	general consumers, home owners
2A	trained professionals
2B	certified tree service workers
2C	general consumers, home owners

Note that the regulations do not establish or recognize any system to "certify" workers. (May 7, 1999)

Lacking wording in the regulation as to which type or class must be used, using an inappropriate type is not a violation of the regulation in and of itself. (May 7, 1999)

All type 1 chain saws need a chain brake, although only type 1B requires it to activate upon kickback regardless of the position of the operator's hands. Only type 2B electric chain saws require a chain brake. (May 7, 1999)

All chain saws should have chain brakes that are able to prevent the chains from moving even though the throttles have been opened from idle to maximum. (April 11, 2000).

All chain saws must use a form of dead-man control that will shut the power off to the chain (although the motor may still run). (May 7, 1999)

The exhaust must flow away from the chain saw and the operator. (May 7, 1999)

The chain saw shall be marked with:
- manufacturer's name
- model number and serial number
- labels for all major controls clearly identifying their use
- saw classification (i.e. type 1A)
- designation of the CSA standard
- for class 1B and 2B, a warning stating that only certified tree service professionals shall use the saw (May 7, 1999)

The standard contains Appendices A and B, explicitly noted as "not a mandatory part of this standard." They suggest general safety precautions for chain saw use. (May 7, 1999)

Automotive pits

91 An employer shall ensure that an automotive pit is designed, installed, operated, inspected and maintained in accordance with the National Fire Protection Association standard NFPA 1, "Fire Prevention Code", 1997 edition, chapter 22-2, "Service Stations, Pits, Below-Grade and Sub-Floor Work Areas" and complies with sections 20-100 to 20-114 of the CSA standard C22.1-98, "Canadian Electrical Code Part 1 (18th edition), Safety Standard for Electrical Installations".

The NFPA standard sets out the following requirements:
1) the pit shall be constructed of masonry, concrete or other non-combustible material
2) stairs shall be non-combustible, slip-proof and have no accessible space underneath
3) exhaust shall be provided at a minimum rate of $0.3m^3$/minute/m^2 (1 cfm/ft^2) at all times the building is occupied or when vehicles are parked in or over the pit. The exhaust intake shall be within 0.3 m (1 foot) of the floor. (May 26, 1999).

The Canadian Electrical Code sets out the following requirements:
1) fixed electrical equipment shall be totally enclosed or constructed to prevent the escape of sparks or hot metal particles
2) Portable lamps shall:
- be totally enclosed
- have a substantial guard
- have all exterior surfaces made of non-conducting materials
- **not** be provided with receptacles for attachment plugs (August 11, 1999).

Practically, a pit will be considered a pit when it is designed for a person to do work from inside it.(April 11, 2000).

Where a walking surface has a "built-in" hazard, such as a garage pit or access stairs, the employer must take appropriate steps to minimize the falling-in hazard (April 6, 2005)

Tire repair and mounting

92 **(1)** Where a split rim or retainer ring type tire is being is being mounted on a rim and is in the process of being inflated an employer shall provide and an employee shall use

(a) a safety cage or restraining device;

The cage or device need not be certified by an engineer. (April 11, 2000)

(b) a clip-on chuck with an adequate length of hose; and

(c) an in-line hand-operated valve with a gauge.

(2) Where a split rim or retainer ring type tire is assembled, an employer shall ensure that the components are assembled in accordance with the manufacturer's specifications, including a multi-piece rim matching chart.

Conveyors

93 **(1)** This Section and Sections 94, 95 and 96 do not apply to any device that is intended for the transport of people and to which the *Elevators and Lifts Act* applies.

Sections 93 through 96 apply to fixed and portable and temporary and permanent conveyors. (April 11, 2000).

(2) An employer shall ensure that a conveyor is constructed or installed so that

(a) there is adequate clearance between the material transported on the conveyor and a fixed or moving object;

(b) pinch points that a person may come into contact with are adequately guarded; and

(c) the conveyor cannot feed onto a stopped power-driven conveyor, or that written work procedures are developed that provide an equivalent level of safety.

(3) Where a person in the workplace has access to a power-driven conveyor, an employer shall ensure that emergency stop devices are installed at designated work stations and other appropriate locations along the run of the conveyor to ensure the safety of a person in the workplace.

Note that in mines, due to section 120(2)'s reference to the CSA standard on electricity in mines, surface mine conveyors must have a pull-cord extending the entire length of the conveyor (clause 3.4.5.1). (May 7, 1999)

94 (1) Where a person is required to cross over a conveyor, an employer shall

(a) provide an adequate means of crossing the conveyor; and

(b) identify the crossing point by adequate means.

(2) No person in a workplace shall

(a) ride on a conveyor; or

(b) stand on the supporting frame of a conveyor.

(3) Despite clause (2)(b), a person may stand on the supporting frame of a conveyor if the conveyor has been locked out.

95 Where a conveyor is installed at a height that may result in falling objects causing injury to a person, an employer shall ensure that

(a) it is equipped with guards or other adequate protection to prevent the material from falling from the conveyor to the workplace below; or

(b) adequate barriers are installed that prevent a person froom being under the conveyor while it is running.

This section requires the potential for injury before it comes into effect. Thus, in cases where access under a conveyor is effectively blocked, there is no potential for injury by falling objects. Thus, the requirements for guards or other adequate protection would not apply (August 11, 1999).

96 Where the rollback of the load or belt creates a hazard to a person at the workplace, an employer shall ensure that an anti-rollback device is installed on a conveyor that carries a load up an incline to prevent the belt or the load from rolling back.

Abrasive wheels and grinders

97 (1) An employer shall legibly post on an abrasive wheel and a grinder the maximum number of revolutions per minute of the wheel and the grinder.

(2) No person shall operate a grinder with an abrasive wheel unless the grinder is rated to provide a number of revolutions per minute equal to or less than the rating of the abrasive wheel.

(3) An employer shall ensure that, before the installation of an abrasive wheel, the abrasive wheel is inspected by a designated competent person for flaws, defects or cracks.

The maximum number of revolutions per minute of the wheel and the grinder shall be as per the manufacturer's specifications. (June 29, 1999).

An abrasive wheel is made of abrasive material held together by some type of resin or cement. A wire wheel or similar device is not an abrasive wheel. (August 11, 1999).

98 (1) An employer shall ensure that a bench grinder is fitted with a protective hood and side shield of sufficient strength to contain fragments of a ruptured wheel.

The protective hood noted in 98(1) may be the guard that is supplied by the manufacturer. (August 11, 1999).

(2) Where a bench or pedestal grinder is used, an employer shall ensure that

(a) a tool rest is mounted on the grinder not more than 3 mm from the abrasive wheel; and

3 mm = approximately 0.12 in

(b) the grinder is secured to prevent unintended movement.

99 Where a pneumatic grinder is used, an employer shall ensure that the governors are maintained by a designated competent person.

100 Unless the manufacturer's specifications otherwise specify, an employer shall ensure that no person

(a) grinds on the side of an abrasive wheel; or

(b) adjusts a tool rest while the abrasive wheel is in motion.

Compressed air used for cleaning

101 **(1)** In this Section, "compressed air" means air at an absolute pressure greater than 275 kPa.

275 kPa absolute = approximately 40 psi absolute or 25 psi gauge. (April 26, 2000)

(2) Where compressed air is used to clean a surface or person, an employer shall ensure that the device that is used to deliver the air is

(a) commercially manufactured and approved in the manufacturer's specifications for the purpose of cleaning a surface or person with compressed air; or

(b) certified by an engineer as adequate for the purpose of cleaning a surface or person with compressed air.

Space heating equipment

102 An employer shall locate, install, operate, inspect and maintain temporary space heating equipment so as to prevent the unintended ignition of any material.

103 Where space heating equipment is powered by a combustible fuel, the employer shall ensure that

(a) the equipment is located on the ground or above a non-combustible floor of sufficient thickness to prevent the transference of enough heat to cause a fire below;

(b) if located above a combustible floor, the equipment is separated from the combustible floor by 75 mm of non-combustible material covered by sheet metal extending 600 mm beyond the heating equipment on all sides.

"above" means "above" or "on." (August 11, 1999).

75mm = approximately 3in

600mm = approximately 2 ft

Part 9 - Tools

General provisions

104 An employer shall ensure that a tool, its accessories and supplies are

(a) made of good quality material adequate for the work for which they are intended to be used;

(b) inspected before being used, and, if not in an adequate condition, repaired or replaced before use;

(c) used only for their intended purpose;

(d) equipped with a device to ensure a secure hand grip where necessary; and

(e) installed, assembled, started, operated, used, handled, stored, stopped, inspected, serviced, tested, cleaned, adjusted, carried, maintained, repaired and dismantled in accordance with the manufacturer's specifications, or, where there are no manufacturer's specifications, in accordance with adequate work procedures developed by a competent person.

A "tool" is a device held in the operator's hands. Where a device is both a tool and a machine the requirements of these regulations for a tool should apply rather than those for a machine. (July 20, 2001)

105 (1) No person shall point a tool that ejects pins, nails or other projectiles at another person.

(2) Where reasonably practicable, an employer shall ensure that where a person works with a device that is to be struck by a tool used by another person, the device to be struck is held by an adequate holding device.

Portable power-operated hand tools

106 An employer shall ensure that a portable power-operated hand tool

(a) is repaired by a designated competent person;

(b) where powered by electricity, is double insulated or grounded, except where battery operated;

(c) where lines or hoses are connected to the tool, has a shut-off mechanism installed on the tool so as to be immediately accessible to the operator; and

(d) is an explosion-proof device where there is a risk of an explosive atmosphere.

This clause applies to pneumatic, hydraulic, and similar lines and hoses, but does not apply to electric wires. (April 11, 2000).

107 (1) Where reasonably practicable, an employer shall ensure that hydraulic, pneumatic, chemical and electrical lines and hoses do not run across aisles, travel ways or work areas.

(2) This Section does not apply where a firefighter is engaged in structural fire-fighting or rescue.

Powder-actuated tools

108 **(1)** In this Section, "powder-actuated tool" means a tool that, by means of a powder-generated explosive force, propels or discharges a fastening device for the purpose of impinging it on, affixing it to or causing it to penetrate another object or material.

(2) An employer shall ensure that a powder-actuated tool is operated by a competent person in accordance with Sections 1 to 9 of ANSI standard A10.3-1995, "American National Standard for Construction and Demolition Operations - Powder-Actuated Fastening Systems - Safety Requirements".

The main training and qualification parts of this standard are referenced in sections 10 and 11. By referring only to sections 1 to 9, the regulation does not require training to be done by only manufacturer's representatives and does not require written tests developed and given by the manufacturer. (August 11, 1999).

This standard defines the term "competent." However, since that definition is inconsistent with the definition given in section 2(g) of these regulations, the definition used in section 2(g) applies. (August 11, 1999)

(3) An employer shall ensure that a powder-actuated tool, the fastener and the powder load complies with the requirements of ANSI A10.3-1995, "American National Standard for Construction and Demolition Operations - Powder-Actuated Fastening Systems - Safety Requirements".

See Appendix L for a summary of this standard. (May 7, 1999)

Part 10 - Welding, Cutting, Burning and Soldering

General provisions

109 **(1)** In this Part, "welding or allied process" means any specific type of electric or oxy fuel gas welding or cutting process including those processes referred to in Appendix A of CSA standard CSA W117.2 - 94, "Safety in Welding, Cutting, and Allied Processes", and includes

See Appendix M for a summary of this standard. (May 19, 1999)

(a) arc welding, brazing, solid-state welding, soldering, resistance welding, and other welding; and

(b) allied processes such as arc cutting, oxygen cutting, thermal spraying, thermal adhesive bonding and other cutting.

(2) An employer shall, where reasonably practicable, comply with the requirements of CSA standard CSA-W 117.2 -94, "Safety in Welding, Cutting and Allied Processes".

The standard establishes two ways to achieve compliance: 1) establishing a welding health and safety program (clause 3 of the standard); or 2) following the procedural requirements outlined in clauses 5 through 11 (Feb. 1, 2004)

110 (1) An employer shall ensure that welding or allied process equipment is erected, installed, assembled, started, operated, used, handled, stored, stopped, inspected, serviced, tested, cleaned, adjusted, carried, maintained, repaired and dismantled in accordance with the manufacturer's specifications.

(2) An employer shall ensure that a welding or allied process is performed by a designated competent person.

111 (1) An employer shall ensure that, before a welding or allied process is commenced, the person who is to operate the equipment has inspected the area surrounding the operation to ensure that adequate precautions have been taken

(a) to remove from the area all hazardous material or processes that produce combustible, flammable or explosive material, dust, gas or vapour; and

(b) to prevent fire or explosion.

(2) Where a welding or allied process is performed above an area where a person may be present, an employer shall ensure that adequate means of protection are taken to protect a person below the operation from sparks, debris and other falling hazards.

112 (1) Except where an employer has demonstrated that a person at or near a welding or allied process is not excessively exposed to radiation or reflection, the employer shall provide adequate screens or prevent a person from entering the work area.

(2) Where screening is used in accordance with subsection (1), the employer shall ensure that the screening is adequate to prevent radiation and reflection from affecting a person at or near the workplace.

This section assumes that where welding occurs near a second person, the second person is over-exposed to radiation; unless the employer can demonstrate otherwise. Where one welder's arc may affect the health and safety of another employee appropriate measures such as clothing, spacing, timing must be implemented (April 11, 2000).

Work on containers

113 (1) An employer shall ensure that no person performs a welding or allied process on a container, pipe, valve or fitting that

(a) holds or may have held an explosive, flammable or otherwise hazardous substance; or

(b) may become pressurized to the point of being a hazard to a person at the workplace,

unless the welding or allied process is performed in accordance with a written work procedure adopted by the employer.

(1A) Where a welding or allied process is performed on a natural gas pipeline or liquids pipeline associated wit a natural gas pipeline, and employer shall ensure that an engineer certifies that the written work procedure required under subsection (1) is in accordance with American Petroleum Institute standard (API) Recommended Practice 2201, "Procedures for Welding or Hot Tapping on Equipment in Service", Fourth Edition, September 1995.

(2) Where a container, pipe, valve or fitting may have held an explosive, flammable or other hazardous substance, and subsection (1A) does not apply, an employer shall include in the written work procedure required under subsection (1), provision

(a) for disconnecting and blanking off or moving out of alignment pipes or locking out valves in the closed position; and

(b) that after ventilation, a designated competent person shall

  (i) where reasonably practicable, examine the area to be welded or processed to ensure that it is free from residue,

  (ii) test air samples to ensure that explosive, flammable or hazardous amounts of gases or vapours have been reduced to less than 1% of the lower explosive limit in areas to be welded or processed, and

  (iii) certify, in writing, that work involving the application of heat can be safely undertaken and that the conditions tested in the area to be heated are likely to be maintained within a predicted and recorded range for the entire time the certification is valid.

(3) The certificate referred to in subclause (2)(b)(iii) shall include

(a) the signature of the competent person;

(b) the date and time the tests

were performed;

(c) the type of work that

  (i) can be performed in the area to be heated, and
  (ii) is explicity banned in the area to be heated;

(d) the means by which the work is to be performed

(e) the expiry date and time of the certificate; and

(f) a record of any tests performed and of any test results

(4) No certification issued under subclause (2)(b)(iii) shall be valid for longer than 24 hours after the time of the examination and test required to be performed under subclauses (2)(b)(i) and (ii).

(5) An employer shall ensure that no person uses the exhaust of an internal combustion engine as a means of decreasing the concentration of flammable and explosive gases and vapours in the area to be welded or processed.

114 An employer shall ensure that a compressed gas hose line or welding cable is adequately protected from damage.

115 (1) No operator of an electric welding machine shall leave the machine unattended without removing the electrode.

"Unattended" as per section 69(b)

(2) An employer shall ensure that appropriate welding and ground leads are used to fasten the electric supply cable securely so that the inner wires of an electric welding machine are not exposed to damage and the cable cannot be separated from the fittings.

Gas welding and allied process

116 (1) An employer shall ensure that a person performing a gas welding or allied process tests a regulator and its flexible connecting hose immediately after it is connected to a gas cylinder, to ensure that there is no leak of the gas supply.

(2) No person shall perform a test required in subsection (1) with a substance that is oil, fat or grease based.

(3) Where a leak of the gas supply develops during the performance of a gas welding or allied process

(a) the person performing the welding or allied process shall cut off the supply of gas; and

(b) the employer shall ensure that work is not resumed until the leak is repaired.

117 Where a gas welding or allied process is carried on, the employer shall

(a) provide a flashback arrestor between the torch and the fuel gas and oxygen supply that

(i) prevents the reverse flow of fuel, gas, oxygen or air from the torch to the supply lines, and

(ii) stops a flame from burning back from a torch into the supply lines;

(b) ensure that hose lines or pipelines for conveying the gases to the burner and the couplings are legibly marked or identified to ensure the hoses are not interchanged; and

(c) ensure that the torch is ignited by a lighting device that is designed for that purpose.

While the flashback arrestor may be positioned anywhere between the gas supply and the torch, the employer is to determine the safest place to position the arrestor so that it meets the intent of 117(a)(i) and (ii).

"Supply lines" refers to a fixed, rigid supply line and not the flexible hoses. (July 20, 2001)

Note some units have a built-in flashback arrestor, not visible to the eye. Inspectors should confirm this by requesting some means of confirmation: manufacturer manual, brochure, web-site etc.

Acetylene

118 Where an employer manufactures acetylene in the workplace, the employer shall establish a written procedure to ensure the health and safety of a person in the workplace.

Compressed flammable gas

119 An employer shall ensure that a cylinder of compressed flammable gas is not stored in the same room as a compressed oxygen cylinder, unless the storage arrangements are in accordance with Part 3 of the *National Fire Code of Canada*, 1995, published by the National Research Council of Canada.

Part 11 - Electrical Safety

General provisions

120 **(1)** An employer shall ensure that an electrical installation is designed, installed, assembled, operated, inspected, serviced, tested, maintained, repaired and dismantled in an adequate manner in accordance with CSA standard C22.1-98, "Canadian Electrical Code Part 1 (18th edition), Safety Standard for Electrical Installations".

The standard contains sections dealing with underground mines as well. These sections do not apply in this regulation. (May 7, 1999)

(2) An employer operating a surface mine shall ensure that an electrical installation at the surface mine is designed, installed, assembled, operated, inspected, serviced, tested, maintained, repaired and dismantled in accordance with CSA standard CAN/CSA-M421-93, "Use of Electricity in Mines".

Section 3.2.1 of the standard requires the owner or operator to give written notice to the Department of Labour of the intent to connect or reconnect an electrical system.(June 18, 1999).

Section 3.2.2 of the standard requires the owner or operator to disconnect the electrical system before abandoning or leaving unattended a mine, and notify the Department of Labour within 14 days.(June 18, 1999)

See Appendix N for a summary of this standard. (May 7, 1999)

121 **(1)** Subject to subsection 120(2) and to the *Underground Mining Regulations*, an employer shall ensure that a power line or power line equipment is designed or constructed to comply with the applicable CSA standard listed below:

(a) CAN/CSA-C22.3 No.1-M87 (R1997), "Overhead Systems"; and

The standard applies to both electrical and communications equipment. The regulation limits its application to electrical supply systems only. (May 25, 1999)

The standard applies only to systems entirely outside buildings and fenced substations. (May 25, 1999)

Note clause 1.5 of the standard allows alternative types of construction (i.e. in technical violation of the standard) so long as the proponent has evidence as to their safety. (May 25, 1999)

(b) CAN3-C22.3 No.7-94, "Underground Systems".

The standard applies to both electrical and communications equipment. The regulation limits its application to electrical supply systems only. (May 7, 1999)

The standard applies only to systems entirely outside buildings and fenced substations. (May 7, 1999)

(2) Subject to subsection 120(2) and to the *Underground Mining Regulations*, an employer shall ensure that the voltage and voltage variation of a power line or power line equipment is limited at the service entrance in accordance with CSA standard CAN3-C235-83 (R1996), "Preferred Voltage Levels for AC Systems, 0 to 50,000 V".

Note that this standard sets out recommendations only. Orders cannot be written solely for violations of the standard. (May 7, 1999) CHECK LANGUAGE.

122 An employer shall ensure that a person who works on an electrical installation is a competent person.

Note the Apprenticeship Act requires construction electricians to be certified in order to work on a project. This is not true for electricians who are employed by the owner or occupant of an industrial establishment to perform electrical maintenance work in that facility. (July 21, 1999)

Personal protective equipment

123 (1) Where a person is required to work on an energized electrical installation, an employer shall, as necessary in the circumstances, provide a person with all protective equipment and devices

This section requires the employer to pay for the listed protective equipment. While the equipment need not be new it must fit and meet the technical specifications of the applicable standards.

(a) necessary to work safely on an energized electrical installation; and

(b) that comply with the applicable standard listed below

(i) ASTM D120-95, "Standard Specification for Rubber Insulating Gloves",

This standard sets out standards for insulating gloves and mitts and the test requirements they must meet. Acceptable gloves and mitts will have a label on their cuff with:

- name of manufacturer
- type (ozone resistant (II) or not (I))
- size
- voltage class (0 to 4)
- proof date

The label must be coloured as follows:

- class 0 - red
- class 1 - white
- class 2 - yellow
- class 3 - green
- class 4 - orange (May 20, 1999)

The standard contains a table where the recommended voltage classes are set out as follows:

Class 0 - up to 1,000 V
Class 1 - up to 7,500 V
Class 2 - up to 17,000 V
Class 3 - up to 26,500 V
Class 4 - up to 36,000 V (May 20, 1999)

(ii) ASTM D1051-95, "Standard Specification for Rubber Insulating Sleeves",

This standard sets out standards for insulating sleeves and the test requirements they must meet. Acceptable sleeves will have a label with:

- name of manufacturer
- type (ozone resistant (II) or not (I))
- size
- voltage class (0 to 4)
- proof date
- right or left

The label must be coloured as follows:

- class 0 - red
- class 1 - white
- class 2 - yellow
- class 3 - green
- class 4 - orange (May 20, 1999)

Voltage ranges for sleeve classes are the same as those above for gloves and mitts. (May 20, 1999)

Note that the sleeves do not actually have to be made of rubber, so long as they have similar electrical resistance as rubber. (May 20, 1999)

(iii) ASTM D1048-99, "Standard Specification for Rubber Insulating Blankets",

This standard sets out standards for blankets and the test requirements they must meet. Acceptable blankets will have a label with:
- name of manufacturer
- type (ozone resistant (II) or not (I))
- voltage class (0 to 4)
- style
- proof date

The label must be coloured as follows:
- class 0 - red
- class 1 - white
- class 2 - yellow
- class 3 - green
- class 4 - orange (May 7, 1999)

Voltage ranges for blanket classes are the same as those above for gloves and mitts. (May 20, 1999)

Note that the blankets do not actually have to be made of rubber, so long as they have similar electrical resistance as rubber. (May 7, 1999)

(iv) ASTM D1050-90, "Standard Specification for Rubber Insulating Line Hose",

This standard sets out standards for line hose and the test requirements they must meet. Acceptable hose will be marked with a label that sets out:
- name of manufacturer
- type (ozone resistant (II) or not (I))
- voltage class (0 to 4)
- style
- The label must be coloured in the same way the labels for blankets must be coloured. (May 7, 1999)

Voltage ranges for hose classes are the same as those above for gloves and mitts. (May 20, 1999)

Note that the hoses do not actually have to be made of rubber, so long as they have similar electrical resistance as rubber. (May 7, 1999)

(v)	ASTM D1049-98, "Standard Specification for Rubber Insulating Covers",	This standard sets out standards for covers and the test requirements they must meet. Acceptable covers will be marked with: - name of manufacturer - type (ozone resistant (II) or not (I)) - voltage class (0 to 4) If a label is used for this information, it must be coloured the same way as blanket labels are coloured. (May 7, 1999) Voltage ranges for covers are the same as those above for gloves and mitts. (May 20, 1999) Note that the covers do not actually have to be made of rubber, so long as they have similar electrical resistance as rubber. (May 7, 1999)
(vi)	ASTM D 178-93 (1998), "Standard Specification for Rubber Insulating Matting",	This standard sets out standards for floor coverings used for worker protection from electricity and the test requirements they must meet. Acceptable matting will be marked with: - name of manufacturer - type (which indicates resistance to ozone, flame or oil) - voltage class (0 to 4). (May 18, 1999) Voltage ranges for hose classes are the same as those above for gloves and mitts. (May 20, 1999)
(vii)	ASTM F 696-97 (Reapproved 1997), "Standard Specification for Leather Protectors for Rubber Insulating Gloves and Mittens", and	This standard sets out standards for leather gloves and mittens used as mechanical protection for rubber gloves (the latter being used for electrical protection). Acceptable gloves/mitts will be marked with: - the hand size - name of manufacturer - overall length The marking may be on the glove/mitt itself, as a tag attached to the glove/mitt or as printed material enclosed with each pair of gloves/mitts. (May 18, 1999) Note that there are no voltage ratings for these protectors. (May 18, 1999)
(viii)	F711-89(1997), "Standard Specification for Fibreglass - Reinforced Plastic (FRP) Rod and Tube Used in Live Line Tools".	This standard sets out standards for rods meant for use on live electrical lines and the test requirements they must meet. Acceptable rods/tubes will be marked with: - name of manufacturer - month and year of manufacture - that the rod/tube meets the requirements of the standard. (May 18, 1999)

Note that there are no voltage ratings for these rods/tubes. (May 18, 1999)

(2) A person who is required to work on an energized electrical installation shall use the appropriate protective equipment or devices required under subsection (1).

124 **(1)** An employer shall ensure that a person who handles an energized power line or power line equipment rated at greater than 15,000 v to ground uses hot line tools to do so, in addition to other personal protective equipment required in the circumstances.

"v to ground" means the voltage between any given live ungrounded part and any grounded part in the case of grounded circuits, or the greatest voltage existing in the circuit in the case of ungrounded circuits. (July 21, 1999).

"Hot line tools" are insulated tools used for working on live circuits. (June 18, 1999)

Hot line tools must be used unless the employer has adopted a code of practice approved by the Director. (June 18, 1999).

(2) A person may use rubber gloves instead of hot line tools to handle energized power lines or power line equipment rated at greater than 750 v phase to phase, where a written work procedure has been adopted as a code of practice by order of the Director for use in such circumstances.

(3) An employer who has adopted a code of practice under subsection (2) shall

(a) provide a copy of the code of practice to each person in the workplace who is required to handle energized power lines or power line equipment rated at or below 15 000 v to ground;

See clause 9(2)(a) for information on training and associated costs (December 14, 2000)

(b) provide training in the code of practice to each person in the workplace who is required to handle energized power lines or power line equipment or perform other activities in accordance with the code of practice; and

(c) communicate the details of the code of practice and the reasons for its implementation to all persons at the location where the work is performed,

Where there is an evidence that the code of practice has not been adhered to, the officer will issue an order suspending the application and use of the code of practice. (June 18, 1999).

and, to the extent that it relates to their work, all persons shall adhere strictly to the terms of the code of practice.

(4) Where an officer determines that a code of practice that is in effect pursuant to subsection (2) has not been strictly adhered to, the officer may make an order suspending the application and use of the code of practice, and the suspension shall remain in place until the Director notifies the employer that the suspension has been lifted.

Hazardous work

125 **(1)** In this Section, "switching device" means a device designed for the sole purpose of opening, closing or opening and closing one or more electrical circuits, and includes

(a) a circuit breaker capable of making, carrying and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal conditions, such as those of a short circuit;

(b) a cutout assembly of a fuse support with either a fuse holder, fuse carrier or disconnecting blade; and

These are commonly found on electrical poles and are used to cut power to a building. (June 18, 1999)

(c) a disconnecting or isolating device used for isolating a circuit or equipment from a source of power.

(2) An employer shall ensure that no work is performed on an energized electrical installation rated at greater than 750 v phase to phase unless the competent person performing the work is accompanied by another competent person.

(3) Subsection (2) does not apply to switching work carried out using a switching device where an adequate written procedure has been developed by the employer in consultation with the committee or representative, if any.

(4) Where compliance with the personal protective equipment requirements and normal work procedures in effect at the workplace is inadequate to control the risk of exposure to an electrical hazard during work on an energized electrical installation due to an unusual factor in the nature of the work, such as the location or condition of the workplace, a competent person not actively engaged in the work shall be designated as a safety watcher to observe a person who is working on or near an energized electrical installation.

(5) A safety watcher required by subsection (4) shall

(a) warn all persons working on or near an energized electrical installation of any potential hazards;

(b) ensure that the requirements of this Part are complied with;

(c) be a competent person able to evaluate relevant hazards, and competent and equipped to initiate a rescue;

(d) be free of any other duties that might interfere with the duties outlined in this subsection;

(e) have the authority to stop work where the task or conditions in the workplace become hazardous; and

(f) remain in the immediate vicinity of the work.

"Unusual factors" includes weather conditions, work environment, and high voltage. (July 21, 1999).

"initiate a rescue" means taking the first action that leads to the process of events specified in the employer's rescue procedure (April 11, 2000).

126 **(1)** In this Section and in Section 128, "authority" means an electrical utility whose primary business is the generation or distribution of electricity.

(2) No person shall carry out work that may bring a person or object closer than 6.0 m to an overhead energized power line or power line equipment where the voltage of the overhead energized power line is not known to the person carrying out the work.

(3) Where work is performed in close proximity to an energized overhead power line or power line equipment rated at less than 750 v phase to phase, an employer shall ensure that the work is performed at an adequate distance to ensure the safety of every person in the workplace from the electrical hazard.

"Adequate distance" means 1m or more away from the energized overhead power line or power line equipment. (June 18, 1999)

(4) An employer shall ensure that no work is carried out, and no person shall carry out work that may bring a person or object closer than the distances set out in the following table to an overhead energized power line or power line equipment rated at greater than or equal to 750 v phase to phase:

Phase to Phase Voltage of Energized Electrical Power Line or Power Line Equipment	**Distance**
750 volts and up to 69 000 volts	3.0 m
greater than 69 000 volts and up to 138 000 volts	5.0 m
greater than 138 000 volts	6.0 m

3m = approximately 10 ft (April 26, 2000)

5m = approximately 16 ft

6m = approximately 20 ft

(5) Despite subsections (3) and (4), where a person is about to commence work that may bring a person or object closer than a distance specified in subsection (3) or (4) to an overhead energized power line or power line equipment described in subsection (3) or (4), an employer shall not permit the person to commence work

Note: the employer may contact Nova Scotia Power regarding their policy and any forms dealing with "Power Services Safe Clearance Reports" - for Division officers these are available on the Division's Intranet page (October 30, 2002).

until the employer has contacted the authority owning or operating the energized power line or power line equipment and

(a) ensured that the energized powerline or power line equipment is insulated or guarded in an adequate manner; or

(b) provided an alternative means of protection from the electrical hazard that provides an equivalent level of safety.

Cutting the power is deemed to be an acceptable alternative. (June 18, 1999)

(6) This Section does not apply to

(a) work performed by a competent person employed, contracted or authorized by an authority;

To take advantage of this clause a worker, i.e. tree trimmer, must be employed, contracted or authorized by an authority. The contractor authorization need not be job specific. (April 11, 2000).

(b) equipment owned by an authority or an employer contracted or authorized by the authority, that is used in the installation, operation, maintenance, repair, dismantling or other work performed on the power line or power line equipment; or

(c) work performed on an energized power line or power line equipment where the employer has, in advance of the work,

The employer must carry out all activities - (i)(ii)(iii)&(iv). (June 18, 1999)

(i) determined the degree of electrical insulation on the power line and power line equipment,

(ii) determined the level of electricity to which the power line or equipment will or may be energized,

(iii) obtained from an engineer, or the manufacturer of the power line and power line equipment, a written certification indicating that a person or object may be brought closer than the distances permitted by this Section, and

(iv) ensured that the work is performed by a competent person in an adequate manner consistent with the recommendations of the engineer or manufacturer providing the certification under subclause (iii).

Plan of electrical installation

127 The owner of a building or structure shall ensure that a competent person

(a) creates and maintains a plan that includes a line diagram that describes the position and the ratings of the components of the electrical installation; and;

(b) updates the plan to reflect a repair or alteration to the electrical installation, where an electrical installation utilized in a building or structure

(i) is rated at greater than 250 v phase to phase,

(ii) is rated at greater than 250 amperes, or

(iii) has multiple service entrances.

The requirement for an electrical plan applies only where an electrical installation utilized in a building or structure

(i) is rated at greater than 250 v phase to phase,
(ii) is rated at greater than 250 amperes, or
(iii) has multiple service entrances.

Recognizing that the intent of the requirement is to allow persons to work safely around electrical systems the plan should at a minimum show those power lines and components that a person would need to be aware of to safely lock out a portion of the electrical distribution system. (November 6, 2000)

What would be considered reasonable in any building will be variable. In a building constructed after the regulation came into effect, an plan of the entire electrical system should be available and maintained. In an older building where no "as built" drawing exists it would be reasonable to identify the features of the distribution system where lock out can be accomplished, what sections of the building the lock out would be effective for and any modifications or alterations introduced to the distribution system after this regulation became effective. (November 6, 2000)

Electrical rooms

128 **(1)** Where a workplace has an electrical room, an employer shall ensure that

(a) the room is kept clean and orderly;

(b) the room is not used for storage of unrelated materials; and

Materials that would be related to an electrical room could be, for example, fuses and switches; however, cleaning supplies, ladders, stationary etc. would not be related materials and cannot be stored in the electrical room.

(c) where the components are rated at more than 750 v phase to phase, a sign is posted on the outside of the room that legibly states "Danger - High Voltage".

(2) Despite clause (1)(c), where an electrical room is in a manhole controlled and maintained by an authority, no sign is required.

Part 12 - Confined Space Entry

Application and interpretation

129	(1)		In this Part, "confined space" means an enclosed or partially enclosed space	All of the conditions specified in 129(1)(a)(b)& (c) must be present at the same time to meet the definition of "confined space". (August 5, 1999).
		(a)	not designed or intended for regular human occupancy;	Factors that would tend to indicate of regular human occupancy are: i) regular presence of an operator is required for the function of the space; ii) persons are present in the space for significant fraction of the day on an ongoing basis. The fact a person enters a space on scheduled (i.e. regular) basis is not sufficient by itself to allow the space to meet the requirements of clause a. (April 11, 2000).
		(b)	with restricted access or exit; and	Restricted access or exit generally means inhibited movement such as bending, crawling, climbing, or having to be mechanically transported. (June 7, 1999).
		(c)	that is or may become hazardous to a person entering it because of its design, construction, location, atmosphere or the materials or substances in it or other conditions.	If an employer is able to minimize or eliminate a hazard so that the space no longer falls within the definition of "confined space", the sections of this regulation that are specific to confined space entry would not apply. This would include, for example, enlarging the access or exit points so they are no longer restricted. Simply providing ventilation for the space, or a respirator for an employee, however, would not be sufficient to remove it from the definition of "confined space". (August 5, 1999).
	(2)		Sections 130 to 137 do not apply to	
		(a)	a development heading in an underground mine; and	
		(b)	a firefighter engaged in structural fire-fighting or rescue, if the firefighter has received adequate training for confined space entry and rescue.	Refer to sections 190 through 203 for equipment requirements for fire fighters. (June 7, 1999). See clause 9(2)(a) for information on training and associated costs (December 14, 2000)

Assessment and written procedures

130 (1) An employer shall ensure that no person enters a confined space until the employer has fulfilled the requirements of this Section and a competent person has provided a written certificate, in accordance with Section 131.

(2) Where a workplace includes a confined space, the employer shall ensure that a person who may be required to enter the confined space has the information necessary to identify it as such.

(3) Where at least one confined space has been identified, an employer shall develop a written confined space entry procedure that includes provision

- (a) that prior to the entry of a person into the confined space, an assessment of the confined space is
  - (i) done in accordance with subsection (8), and
  - (ii) recorded by the person conducting the assessment in accordance with Section 131;

An assessment completed per section 130 (8) identifies specific hazards, the means of controlling the hazards to ensure the health and safety of persons, and the means of monitoring conditions during the specific confined space entry. (June 7, 1999).

- (b) for the training required by a person who may enter a confined space in the course of the person's work, and for the training required by a person who may undertake rescue operations with regard to a confined space, including training on

See clause 9(2)(a) for information on training and associated costs (December 14, 2000)

(i) proper use of personal protective equipment,

(ii) written rescue procedures,

(iii) maintaining contact between a person in the confined space and an attendant required under clause 134(2)(a) and the means by which the written rescue procedure is initiated in the event of an emergency in the confined space,

(iv) the limitations on the type of work that can be performed in the confined space, and

(v) the means of identifying a hazard while in a confined space;

(c) for the process for notifying a person entering a confined space of the specific type of work that may be performed in the confined space;

(d) for the method to be followed by a person entering into, exiting from or occupying the confined space;

(e) for the protective equipment that is to be used by every person entering

A means of communication must be established between the person in the confined space and the attendant. (June 25, 1999).

the confined space;

(f) for the written emergency procedures to be followed in the event of an accident or other emergency in or near the confined space, including

  (i) immediate evacuation of the confined space when an alarm is activated or there is any significant, unexpected and potentially hazardous change in the concentration, level or percentage referred to in subsection (8),

  (ii) a determination of whether more than one person is required to be present outside a confined space during the occupancy of any person, and

  (iii) a written rescue procedure;

(g) for the protective equipment and emergency equipment to be used by a person who undertakes rescue operations in the event of an accident or other emergency;

(h) for a written procedure for testing the confined space in an adequate manner, at regular intervals and on a

The degree of safety provided by an emergency procedure would vary with the degree of hazard likely to be encountered in the confined space. Employers may use the 911 system as part of their emergency procedure; however, before doing so one should consider:

i) not all emergency service personnel are trained or equipped for confined space rescue;

ii) in some case the response time of the emergency services may be too long; and

iii) the emergency service may be occupied on a previous call and unable to respond to a rescue (April 11, 2000).

There are no specific requirements as to the content of the rescue procedure - using 911 may be an acceptable alternative for specific instances - this would have to be determined by the workplace parties (Feb. 1, 2004)

Any testing of the confined space must be done so as to not put the tester at risk. (August 5,1999).

continuous basis, if necessary, to ensure the concentration or level of a hazardous substance or physical agent complies with the limits in subsection (8); and

(i) for a means of ventilating the confined space to ensure the removal or dilution of all airborne hazardous substances from the confined space.

The type of ventilation used should consider the materials to be used, possible reactions between materials, the operations to be performed, any chemicals that may inadvertently enter the confined space, and anything the confined space may have contained. (August 5, 1999).

(4) An employer shall provide to each person entering the confined space and a person who may undertake rescue operations the protective equipment and emergency equipment referred to in this Section.

(5) An employer shall ensure that

(a) a person who enters a confined space is trained at least once every 2 years in accordance with the procedures set out in clause (3)(b); and

(b) a person who undertakes rescue operations is trained at least once every year in accordance with the procedures set out in clause (3)(b).

"Every person ...." means workers, attendants and rescue workers involved in confined space entry. (April 11, 2000)

(6) Every person who enters into, exits from or occupies the confined space shall follow the written procedures and use the protective equipment and emergency equipment as required.

(7) An employer shall review the confined space entry procedure at least once a year and amend it, if necessary.

(8) An employer shall designate a competent person who shall perform the assessment required in clause (3)(a),which shall include

(a) where the level of a chemical substance or a mixture of chemical substances may constitute a hazard, tests to ensure that the concentration of a chemical substance or a mixture of chemical substances in the confined space does not exceed its occupational exposure limit under the *Occupational Health Regulations* or 50% of its lower explosive limit;

(b) where the level of a physical agent may constitute a hazard, tests to ensure that the level of the physical agent in the confined space is not hazardous;

(c) tests to ensure that the level of oxygen in the atmosphere in the confined space is not less than 19.5 % and not more than 22.5 %, unless the employer can demonstrate that an unsafe oxygen level is not a possibility in the circumstance;

(d) a determination of whether the concentrations, levels or percentages referred to in clauses (a), (b) and (c) can be maintained during the period of proposed occupancy of the confined space;

(e) a confirmation that any liquid in which the person may drown or any free flowing solid in which a person may become entrapped has been removed from the confined space or that work practices have been developed that specifically address the presence of the liquid or solid;

(f) a confirmation that entry of any liquid, free flowing solid or hazardous substance into the confined space that could endanger the health or safety of a person has been prevented by a secure means of disconnection, the fitting of blank flanges or the implementation of a double block and bleed written procedure established by the employer or similar positive actions;

Note: simply closing a valve would not be considered as a "secure means of disconnection" (October 30, 2002)

(g) confirmation that a machine, equipment, tool or electrical installation that presents a hazard to a person entering into, exiting from or occupying the confined space has been locked out; and

(h) confirmation that the opening for entry into and exit from the confined space is sufficient to allow safe passage of a person who is using personal protective equipment or emergency equipment.

(9) Where there is no possibility that a hazard identified in clauses (8)(a), (b) and (c) may occur, the requirements of clause (3)(h) do not apply.

(10) The competent person referred to in subsection (8) shall, when performing the tests required under clauses (8)(a), (b) and (c), use appropriate and properly calibrated instruments that have been functionally tested and maintain a written record of the functional and calibration tests.

(11) An employer shall keep the assessment and the confined space entry procedure required under subsection (3) at the place of business of the employer nearest to the workplace at which the confined space is located.

(12) An employer shall make available a copy of the confined space entry procedure to all persons involved in the entry of a confined space.

"All persons" includes workers entering the confined space, attendants, and persons who may be involved in a rescue. (April 11, 2000).

Certification of confined space conditions

131 (1) Subsequent to performing the tests required in clauses 130(8)(a), (b) and (c), a designated competent person shall certify, in writing, that the conditions tested in the confined space are likely to be maintained within a predicted and recorded range for the entire time the certification is valid, and the certification shall include

(a) the signature of the competent person;

(b) the date and time of when the tests were performed;

(c) the type of work that

(i) can be performed in the confined space, and

(ii) is explicitly banned in the confined space;

(d) the means by which the work is to be performed;

(e) the expiry date and time of the certification; and

(f) a record of the tests performed and of the test results.

The currently valid certification is to be maintained in legible condition. (April 11, 2000).

(2) No certification issued under subsection (1) shall be valid for longer than 24 hours after the time the tests required by clause 130(8)(a) and (b) were performed.

The aim of the of the section is to ensure no one is in a confined space more than 24 hours after it was tested. Repeating the test before the 24 hours have expired (with appropriate record keeping) would allow the form to last longer than the 24 hours. (March 1, 2004)

(3) An employer shall post a copy of the currently valid certification required in subsection (1) at the entrance to the confined space for the duration of the confined space occupancy.

(4) An employer shall maintain a copy of the certification required in subsection (1) for 12 months.

Purging and further testing

132 Where the tests required in clauses 130(8) (a), (b) and (c) indicate that the concentration level or percentage referred to in those clauses cannot be complied with, an employer shall

(a) ensure that, where reasonably practicable, the confined space is purged at least twice to eliminate the hazards referred to in clauses 130(8)(a) to (d); and

(b) after the purging, ensure that the tests required under subsection 130(8) are conducted again.

Consideration must be given to the purging agent to ensure it does not constitute a further hazard. (August 5, 1999).

"Purge" is not defined by the regulations; resorting to a dictionary meaning purge means "to make free of something harmful or unwanted". The employer must ensure harmful gases or dusts are removed form the confined space. (March 1, 2004)

Response to hazardous condition

133 (1) An employer shall ensure that no person enters or remains in a confined space where the tests conducted under clause 130(8)(a) indicate that a concentration of a chemical substance or mixture of chemical substances in the confined space equals or exceeds 50% of the lower explosive limit of the chemical substance or mixture of chemical substances.

"enter" is interpreted to mean a person's entire body is in the confined space. Placing a body part (hand, arm, head etc) does not constitute "entering" a confined space. Caution should be used when placing your head in a confined space as this may have the same dangers (gases, etc) associated with it as entering the confined space (Feb.1 , 2004)

(2) Where the concentration of a chemical substance or mixture of chemical substances may cause a flammable or explosive hazard, and where the tests conducted under clause 130(8)(a) indicate that the concentration of the substance or substances in a confined space is between 10% and 50% of the lower explosive limit, an employer shall

(a) provide explosion-proof lighting and ensure that it is used where necessary; and

(b) ensure that the only work performed in the confined space is cleaning or inspecting and is of such a nature that it does not create any source of ignition.

"inert" means not reacting chemically with other substances, for example: a non-reactive gas like nitrogen would have been blown into a confined space to the point where not enough oxygen remains to support an explosion (March 1, 2004)

(3) Where the level of oxygen in a confined space is more than 22.5% and a person is to work in the confined space, an employer shall ensure that the confined space does not contain any substance which would be classified as flammable and combustible material or as dangerously reactive material under the *Controlled Products Regulations* made under the *Hazardous Products Act* (Canada).

(4) Despite subsection (1), where the tests conducted under clause 130(8)(a) indicate that the concentration of a chemical substance or mixture of chemical substances in the confined space exceeds, or is likely to exceed, 50% of the lower explosive limit, measured at atmospheric conditions containing 20.9% oxygen, of the chemical substance or mixture of chemical substances and cannot be lowered below that prescribed threshold level, a person may enter the confined space if the employer ensures that

(a) the atmosphere is confirmed inert by a competent person after the performance of appropriate tests; and

(b) the person is using appropriate protective equipment when working in the confined space.

Protective equipment and security measures

134 (1) An employer shall ensure that all protective equipment and emergency equipment identified under subsection 130(3) is provided as close as reasonably practicable to the entrance to the confined space before a person enters the confined space.

(2) Where a person enters a confined space, an employer shall ensure that a designated competent person

(a) is in attendance in the immediate vicinity of the confined space;

"immediate vicinity" means close enough to the confined space to enable the person to physically check on the status of the individual in the confined space in time to initiate the emergency response procedure. (August 5, 1999).

(b) has a means of adequate communication with a person inside the confined space;

"adequate communication" is dependent upon the hazards present in the confined space and the type of communication used. (April 11, 2000).

"means" of communication may include voice, radio, and ropes. (August 5, 1999).

(c) is provided with a means of activating the rescue procedure in an emergency,

(d) is adequately trained in the emergency response procedure; and

(e) maintains a record of who is in the confined space.

(3) An employer shall

(a) where reasonably practicable, provide a person entering into and occupying a confined space with a full body harness;

If an employer decides it is not "reasonably practicable" to use a full body harness, they must be able to defend the decision if challenged -there should be evidence to show the issue was considered and why it was determined to not be reasonably practicable. Jan 1, 2003

(b) ensure that a full body harness provided under clause (a) is worn; and

(c) where it does not present a hazard, ensure that an attached life line is

  (i) securely fastened to an anchor point, and

  (ii) controlled by the competent person referred to in subsection (2).

(4) An employer shall ensure that the full body harness referred to in subsection (3) complies with the requirements for Group E harnesses in CSA standard CAN/CSA-259.10-M90, "Full Body Harnesses".

The standard sets out that Group E harnesses are specifically for confined entry and exit (raising and lowering). (August 5, 1999)

The harness shall have a durable label that states:
- manufacturer's/vendor's identity
- size
- date of manufacture
- model number
- the fact it is a class E harness (May 7, 1999)

Respiratory protective equipment

135 (1) An employer shall provide

(a) appropriate respiratory protective equipment to a person who enters a confined space where the concentration of a chemical substance or a mixture of chemical substances in a confined space is hazardous to the health or safety of a person; and

(b) positive pressure respiratory protective equipment to a person who enters a confined space where the concentration of oxygen is less than 19.5 %.

(2) An employer shall ensure that the respiratory protective equipment referred to in clause (1)(b).

(a) has an air line and an independent 5-minute supply of air; or

(b) is self-contained and equipped with an audible alarm that sounds when the air supply has diminished to

(i) 20% of the capacity of the unit, or

(ii) a 5-minute reserve.

Respiratory equipment must be approved by a recognized body, such as the National Institute for Occupational Safety and Health.(April 11,2000).

Hazard of electrical shock

136 Where there is a hazard of electrical shock in a confined space, an employer shall ensure that electrical equipment taken into the confined space is

(a) battery operated;

(b) double insulated;

(c) bonded to ground and not exceeding 30 v and 100 volt-amps; or

(d) equipped with a ground fault circuit interrupter of the Class A type that complies with CSA standard C22.1-98, "Canadian Electrical Code Part I (18th edition), Safety Standard for Electrical Installations" and that is tested before each use.

137 An employer shall ensure that adequate warning signs and barricades are installed or erected to protect a person working as part of a confined space entry, if a hazard from any form of traffic exists.

Where the confined space entrance is so situated or equipped as to be a potential impediment to vehicular traffic on a road way, or to make it prudent for an approaching driver to reduce the speed or to alter the path of travel of a vehicle, the signs and barricades should meet the requirements of the latest edition of the Temporary Workplace Traffic Control Manual. (April 11, 2000)

Part 13 - Premises and Building Safety, Construction and Demolition

Walking surfaces

138 In Sections 139 to 152, measurements of lumber are nominal for dressed dimensions.

"nominal" means a description of a dimension that may vary from the actual dimension. For example, a piece of lumber may be described as a "2x4", but in actual fact it is 1 3/4' by 3 3/4'.(August 11, 1999).

139 **(1)** An employer shall ensure that a floor, stairway, passageway or similar walking surface is designed, constructed and maintained so as not to create a hazard to a person in the workplace.

(2) Where a floor, stairway, passageway or similar walking surface is slippery for any reason except for weather or climatic conditions, an employer shall ensure that devices such as matting or grating are used, where necessary, to prevent slipping and, if such devices are inadequate to prevent slipping, that non-slip footwear is worn by employees.

(3) Where a floor, stairway, passageway or similar walking surface at or near a workplace becomes slippery as a result of weather or climatic conditions, an employer shall ensure that the floor, stairway, passageway or similar walking surface is kept free from falling or slipping hazards by removing ice, snow or water, to the extent reasonably practicable, and using materials such as ashes, sand, salt, or other measures where appropriate to prevent slipping or falling.

Where a walking surface has a "built-in" hazard, such as a garage pit or access stairs, the employer must take appropriate steps to minimize the falling-in hazard (August 1, 2004)

Access and exit

140 (1) An employer shall provide a safe means of access to and exit from all work areas.

(2) An employer shall provide adequate information to ensure that every person in the workplace is able to exit the workplace in a safe manner in the event of an emergency.

"adequate information" includes directions to the appropriate emergency exits and any other information that is required to allow a person to exit the building safely. (August 11, 1999).

(3) An employer shall provide overhead protection at every means of access to and exit from a building, structure or project where there is a hazard of falling material that may injure a person at or near the workplace.

(4) This Section does not apply where a firefighter is engaged in structural firefighting or rescue.

Stairways

141 **(1)** Subject to subsections (2) and (3), an employer shall ensure that a permanent stairway is designed, constructed and maintained in accordance with the *Nova Scotia Building Code* under the *Building Code Act*.

The *Building Code Act* applies to the construction or demolition of a building on and after the first day of April, 1987.

"Construct" means to do anything in the erection, installation, extension, relocation, material alteration or material repair of a building and includes the installation of a factory-made building fabricated or moved from elsewhere. (August 11, 1999).

(2) Where the *Nova Scotia Building Code* under the *Building Code Act* does not apply to a permanent stairway built after this Section comes into force, an employer shall ensure that the permanent stairway

(a) meets or exceeds the requirements of Section 142; or

(b) is certified by an engineer as having been constructed in accordance with the certified design of an engineer.

(3) Where

(a) the *Nova Scotia Building Code* under the *Building Code Act* does not apply to a permanent stairway built before this Section comes into force; and

(b) there is reasonable doubt as to whether the permanent stairway is adequate,

an employer shall ensure that an engineer provides a written assessment of the permanent stairway.

(4) Where a written assessment required under subsection (3) identifies an inadequacy, an employer shall ensure that

(a) the stairway is removed; or

(b) modifications are made and are certified by an engineer as having been made in accordance with the certified design of an engineer.

142 **(1)** An employer shall ensure that a temporary stairway

A temporary stairway is a stairway installed during construction, alteration or a similar activity that is meant to be removed before the construction or alteration is complete. (August 11, 1999).

(a) is of sufficient strength to withstand 4 times the maximum load likely to be imposed;

(b) has treads that are a minimum of 900 mm in length;

900mm = approximately 3 ft (April 26, 2000)

(c) is pitched not more than 60° from the horizontal;

(d) has risers constant in height that are not less than 125 mm and not more than 260 mm in height;

125mm = approximately 5 in; 260mm = approximately 10 in (April 26, 2000).

(e) has a maximum height of 4 m between landings;

4m = approximately 13 ft (April 26, 2000)

(f) has landings, if any, with a minimum clearance of 900 mm measured in the direction of the run;

(g) has a vertical clearance of 2 m from the top of the tread at all points in the stairway; and

2m = approximately 6.5 ft (April 26, 2000)

(h) has treads constant in width and not less than 230 mm in width.

230mm = approximately 9 in (April 26, 2000)

(2) Despite clause (1)(b), an employer shall ensure that a stairway that is commercially manufactured and used as a means of access or exit for a scaffold is at least 450 mm in length.

450mm = approximately 1.5 ft (April 26, 2000)

(3) An employer shall ensure that a temporary stairway having 4 or more risers

(a) has a guardrail on any open side and a railing on any enclosed side, where the risers are 2.2 m or less in length and

2.2m = approximately 7 ft

(b) has a guardrail on any open side and in the centre and a railing on any enclosed side, where the risers are more than 2.2 m in length.

(4) An employer shall ensure that a guardrail referred to in subsection (3) is installed

(a) with posts that

(i) are spaced at intervals of not more than 2.4 m, and

2.4m = approximately 8ft (April 26, 2000)

(ii) are secured against movement by the attachment of the posts to the stairway, or by another means that provides an equivalent level of safety;

(b) with a top railing that is between 0.90 and 1.06 m above the midpoint of the tread and securely fastened to posts secured in compliance with clause (a); and

between .90m and 1.06m = approximately between 3 ft and 3.5 ft (April 26, 2000).

(c) with a second railing on the inner side of the posts midway between the top railing and the midpoint of the tread.

(5) An employer shall ensure that a wooden supporting structure or wooden railing of a temporary stairway, in addition to the requirements of subsection (4),

(a) is at least 50 mm thick and 100 mm wide; and

50mm = approximately 2 in; 100mm = approximately 4 in (April 26, 2000).

(b) is made of No. 1 grade spruce or other lumber that provides an equivalent level of safety.

(6) An employer shall ensure that a railing of a temporary stairway that is mounted directly on a wall or partition

(a) is fixed so as not to interfere with the smoothness of the top and side surfaces of the railing;

(b) is continuous throughout the flight of stairs and landings;

(c) is at least 40 mm in width; and

40mm = approximately 1.5 in (April 26, 2000)

(d) where brackets are used, has brackets to which a railing is fixed spaced not more than 2.4 m apart and has a clearance of at least 40 mm between the railing and any wall or partition or any obstruction on the wall or partition to which the brackets are attached.

(7) An employer shall ensure that a guardrail consisting of wire rope, in addition to the requirements of subsection (4)

(a) has wire rope railings that are at least 8 mm thick;

8mm = approximately 0.5 in (April 26, 2000)

(b) is identified with high visibility markings placed at least every 1.5 m on the top railing; and

1.5m = approximately 5 ft (April 26, 2000)

(c) has railings with turnbuckles or other means that provide adequate tension to ensure an equivalent level of protection to that provided by a wooden guardrail.

(8) An employer may use a manufactured guardrail in place of a wooden or wire rope guardrail if it provides an equivalent level of protection to that provided by a wooden guardrail.

(9) An employer shall ensure that a detour guardrail is installed when a stairway ends in direct proximity to a hazard or potential hazard.

143 (1) An employer shall ensure that stairs are installed in a building or structure between floors as the building or structure is constructed.

(2) An employer shall ensure that a skeleton steel stairway with treads that are not completed has temporary wooden treads securely set into the full length and width of the steps and landings.

Ramps

143(A) For purposes of Sections 144 and 145, "ramp" means a ramp designed primarily for pedestrian use.

144 **(1)** Subject to subsections (2) and (3), an employer shall ensure that a permanent ramp is designed, constructed and maintained in accordance with the *Nova Scotia Building Code* under the *Building Code Act*.

(2) Where the *Nova Scotia Building Code* under the *Building Code Act* does not apply to a permanent ramp built after this Section comes into force, an employer shall ensure that the permanent ramp

(a) meets or exceeds the requirements of Section 145; or

(b) is certified by an engineer as having been constructed in accordance with the certified design of an engineer.

(3) Where

(a) the *Nova Scotia Building Code* under the *Building Code Act* does not apply to a permanent ramp built before this Section comes into force; and

(b) there is a reasonable doubt as to whether the permanent ramp is adequate,

an employer shall ensure that an engineer provides a written assessment of the permanent ramp.

(4) Where a written assessment required under subsection (3) identifies an inadequacy, an employer shall ensure that

(a) the ramp is removed; or

(b) modifications are made and are certified by an engineer as having been made in accordance with the certified design of an engineer.

145 **(1)** An employer shall ensure that a temporary ramp

(a) has a maximum slope of 1/6;

(b) is equipped with a non-slip surface or cleats;

(c) where the ramp is greater than 1.8 m in rise, has a guardrail and supporting structure on any open side;

1.8m = approximately 6ft

(d) where planks are used, has planks securely fastened together;

(e) has a minimum width of 450 mm; and

(f) is able to withstand 4 times the maximum load likely to be imposed on the ramp.

(2) An employer shall ensure that a guardrail referred to in clause (1)(c) is constructed in accordance with the requirements for a guardrail in subsection 142(4).

Catwalks

146 (1) In this Section, "catwalk" means a walkway that is 1.8 m or more above the ground or floor level.

(2) An employer shall ensure that a catwalk

(a) meets or exceeds the requirements of subsections (4) and (5); or

(b) is certified by an engineer as having been constructed in accordance with the certified design of an engineer.

(3) Where there is a reasonable doubt as to whether a catwalk is adequate, an employer shall ensure that

(a) an engineer provides a written assessment of the permanent catwalk, and

(b) where the assessment of the engineer required by clause (a) identifies an inadequacy,

(i) the catwalk is removed, or

(ii) modifications are made and are certified by an engineer as having been constructed in accordance with the certified design of an engineer.

(4) An employer shall ensure that a temporary catwalk

(a) has a minimum clear width of 450 mm;

(b) is equipped with a guardrail in accordance with the requirements for a guardraill in subsection 142(4); and

(c) is able to withstand 4 times the maximum load likely to be imposed on it.

Ladders

147 An employer shall ensure that a fixed ladder is designed, constructed, installed and maintained in accordance with ANSI standard A14.3 - 1992 "American National Standard for Ladders - Fixed - Safety Requirements".

The standard requires a safety cage whenever the safe surfaces joined by the ladder are more than 24 feet (7.3 metres) apart. The cage shall end between 7 and 8 feet (2.1 and 2.4 metres) from the lower safe surface. (May 7, 1999)
The rungs on a ladder must be 12 inches (.3 metres) apart and each rung must be at least 16 inches (0.41 metres) wide. (May 7, 1999)
The ladder must extend 3 ½ feet (1.07 metres) above the upper safe surface. (August 11, 1999)

Design requirements for ladder cages are in section 6 of the cited standard; those for ladder safety systems are in section 7. (March 1, 2004)

148 **(1)** An employer shall ensure that a portable ladder used at a workplace is

(a) able to withstand 4 times the maximum load likely to be imposed;

Class 1 ladders are tested to 1000 lbs (4 times the maximum load), maximum workload for these ladders are 250lbs; Class 2 ladders are tested to 900lbs and the maximum workload would be 225lbs. Where the officer suspects the maximum workload would be above the values for these class of ladders, the employer can offer proof (manufacturer's specifications) that the ladder has been tested above those values and is therefore safe. For example: K.P. Systems Inc. sells a ladder designed for a maximum workload of 300 lbs and has been tested to 4 times that amount. (June 19, 200)

(b) clean and free of grease, oil or other substances that may cause slipping;

(c) maintained in a safe condition;

(d) inspected by a competent person before each use to ensure all components are in an adequate condition and the ladder is safe to use; and

(e) not used, where the inspection required in clause (d) identifies an inadequate condition with the ladder.

(2) An employer shall ensure that a person using a fixed or portable ladder shall

(a) face the ladder when climbing or descending;

(b) when more than 1m above a safe surface, maintain adequate contact with the ladder, such as 3 point contact;

The requirement here is for the person to maintain "adequate contact with the ladder." Although 3 point contact is listed, it is only an example. Any method that allows for the person on the ladder to maintain adequate contact would be accepted as meeting the requirements of the Occupational Safety General Regulations.

Note that clause 7(2)(c) of the *Fall Protection and*

Scaffolding Regulations also deals with working on ladders and should be considered where it applies. (October 06, 2000).

(c) where the person is standing on a ladder, stand in the centre between the side rails;

(d) where the ladder is a step ladder, not stand on the material shelf, the top or the top step of the ladder; and

(e) where the ladder is not a step ladder, not work from the top three rungs of the ladder.

(3) Clauses (2)(b), (c), (d) and (e) do not apply to a firefighter engaged in structural firefighting or rescue.

(4) An employer shall remove a ladder from service when it has loose, broken or missing rungs, split side rails or other defects that may be hazardous to the safety of a person at the workplace.

149 (1) An employer shall ensure that a wooden portable ladder that is not commercially manufactured

(a) is made of No. 1 or No. 2 spruce, pine, or fir as graded according to CAN/CSA-0141-91, "Softwood Lumber", or other lumber that provides an equivalent level of safety;

(b) is not painted other than by being preserved with a transparent protective coating;

(c) if a single ladder, does not exceed 9 m in length;

9m = approximately 30ft. (April 26, 2000)

(d) has rungs that are

(i) free of knots,

(ii) designed to carry a load of 200 kg placed at the centre,

200kg = approximately 440 lbs. (April 26, 2000)

(iii) uniformly spaced with a maximum rise of 300 mm,

300mm = approximately 1 ft. (April 26, 2000)

(iv) secured to each side of the side rail of the ladder by at least 3 screws or spiral nails of adequate length or by attachments giving equivalent or better strength, and

(v) subject to subsection (3), cleated to the side rails; and

(e) has side rails that

(i) are dressed on all sides and without sharp edges,

(ii) subject to subsection (3), have a uniform clear width between them of not less than 300 mm for ladders 3 m in length or less, and increasing 1 mm in width for each 100 mm in excess of 3 m,

...uniform clear width between them of not less than approximately 1 ft for ladders approximately 10ft in length or less and increasing approximately 0.039 in in width for approximately each 4 inches in excess of 10 ft. (April 26, 2000)

(iii) where the ladder is less than 5.7 m in length, have dimensions of at least 50 mm thick by at least 100 mm wide, and

5.7m = approximately 18.5 ft; 50mm = approximately 2 in; 100mm = approximately 4 in. (April 26, 2000)

(iv) subject to subsection (3), where the ladder is 5.7 m or greater in length, have dimensions of at least 50 mm thick by at least 150 mm wide.

150mm = approximately 6 in. (April 26, 2000)

(2) An employer shall ensure that a ladder does not sway or sag in an unsafe manner.

(3) An employer shall ensure that a portable ladder that is designed specifically for the purpose of harvesting fruit from trees and is used only for that purpose, is erected, constructed, maintained and used so as to be adequate for that purpose.

(4) Subclause (1)(d)(v) and subclauses (1)(e)(ii) and (iv) do not apply to a ladder that conforms to the requirements of subsection (3).

150 (1) An employer shall ensure that a portable ladder that is commercially manufactured is designed and manufactured in accordance with CSA standard CAN3-Z11-M81, "Portable Ladders".

A ladder meeting the CSA standard will have a marking indicating :
- manufacturer's name or trademark
- date of manufacture
- nominal length
- maximum extended length (where applicable)
- Grade (1,2 or 3), projected use and load rating
- a series of safety cautions set out in the standard, such as "Do not over reach," "Check ladder before use," "Avoid contact with electrical wiring." (June 8, 1999).

The standard defines "step ladder and step stool" - the important parts being having steps/rungs and non-adjustable in length. If step stools have the above features they would be covered by the requirements of the regulation/standard - if the step stool is a cylinder with no steps - simply a top platform - it is outside of the scope of the standard (Feb 1, 2004)

Ladders manufactured to solely other standards, ANSI for example, would not be allowed unless they can be proven to meet the CSA requirements - alternatively the employer may apply for a deviation to use ladders certified by other standards (Feb. 1, 2004)

(2) Despite subsection (1), an employer shall ensure that Grade 3 portable ladders, as described in any edition of CSA standard CAN3-Z11, "Portable Ladders", are not used at a workplace.

The CSA standard defines a grade 3 ladder as a "Household" ladder, meant for light use. It is tested to less stringent standards than are grade 1 and 2 ladders (Construction/industrial and Tradesman/farm respectively). (August 11, 1999).

(3) An employer shall ensure that a commercially manufactured portable ladder

(a) where it is an extension ladder, maintains an adequate overlap between the sections of the ladder;

"adequate overlap" is the overlap set out in the manufacturer's specifications. (August 11, 1999).

(b) has locks engaged before the extension ladder is climbed; and

(c) where there is risk of contact with live electrical conductors, is non-conductive.

151 (1) An employer shall ensure that when a portable ladder is used

(a) it is placed on a firm footing;

(b) it is secured in an adequate manner against movement as soon as is reasonably practicable;

(c) as a means of access or exit, it

(i) has side rails that extend at least 1 m above any platform or landing, and

(ii) has a clearance of at least 150 mm between it and the supporting structure, except in the area where the ladder is supported against the structure; and

(d) as a step ladder, it has legs securely held in position by means of metal braces or an equivalent rigid support.

(2) An employer shall ensure that, when a portable ladder is used, it is not

(a) spliced together with another ladder unless the spliced section is braced so that the spliced side rails are as strong as the original side rails;

(b) placed in front of or against a door that can be opened towards the ladder unless the door is blocked in the open position, locked or guarded;

(c) used as a scaffold, ramp, or as a support for such flooring;

(d) placed on a box, barrel, scaffold, or other unstable base;

(e) lashed to another ladder to increase its length; or

(f) located in an elevator shaft or hoistway when such space is being used for hoisting.

152	Where a portable ladder is used as a means of access or exit for a height greater than 6 m and for 7 or more persons, an employer shall provide 2 separate lines of ladders.	6m = approximately 20 ft. (April 26, 2000)

Underground utility lines

153 (1) Where the location of any underground electrical, gas or other utility line or piping is likely to endanger a person at a workplace, an employer shall ensure that before beginning an excavation or trench the utility that owns or operates the underground electrical, gas or other utility line or pipe is contacted in order to have the utility clearly locate and mark the underground electrical, gas or other utility line.

(2) Except as provided in subsection (3), an employer shall ensure that no object or person comes in contact with the line located or marked in accordance with subsection (1).

(3) An object or person may come into contact with an underground electrical, gas or other utility line or piping only

(a) after it has been located and marked in accordance with subsection (1); and

(b) where the work involving the contact is performed by or in accordance with the instructions of a competent person employed, contracted or authorized by the utility that owns or operates the underground electrical, gas or other utility line or pipe.

Bracing and supports

154 (1) An employer at a project shall ensure that

(a) work is completed on any component designed to support or give added support to a part of the project before proceeding with any work that adds to the load on that part;

(b) a free standing wall of brick, concrete blocks or similar materials greater than 2 m in height is braced from both sides until the wall is attached to a rigid structure and the mortar has set adequately;

2m = approximately 6.5 ft (April 26, 2000)

(c) a free standing wall or structure designed to support roof components or any load is braced in an adequate manner to prevent collapse of the wall or structure; and

(d) a column is erected in an adequate manner to prevent collapse of the column and, where further support is required to ensure that the column does not collapse, braced in an adequate manner.

(2) An employer at a project shall use bracing or shoring for support beneath floor levels where concrete is being poured.

(3) An employer at a project shall

(a) ensure that bracing or shoring is designed by an engineer and is erected, maintained and dismantled in accordance with the engineer's certified specifications; or

(b) retain the bracing or shoring at all floor levels beneath the floor where concrete is being poured until the removal of the bracing or shoring is authorized in writing by an engineer.

(4) An employer shall ensure that any bracing or shoring referred to in this Section complies with CSA standard CSA S.269.1-1975, "Falsework for Construction Purposes."

The standard applies only to temporary, vertical supports (1.1) (May 7, 1999)

(5) An employer shall ensure that footings for shoring and bracing are designed to support the maximum load likely to be imposed, without excessive settlement or deformation.

Drawings and instructions, stamped by an engineer, must be on-site at all times during erection and use (7.1.1) (May 7, 1999)

By-stander safety

155 Where a project may cause a hazard to a pedestrian or other person at or near the workplace, an employer shall take adequate precautions to ensure the safety of the pedestrian or other person at or near the workplace.

Construction work in compressed air

156 An employer shall ensure that construction work in compressed air is conducted in accordance with CSA standard CAN/CSA-Z275.3 M-86(R1992), "Occupational Safety Code for Construction Work in Compressed Air".

Construction work shall be considered to be undertaken in compressed air when the air pressure is maintained by mechanical means at 10 kPa (1.5 psi) or more above the atmospheric air pressure.

Work in such conditions is highly complex and specialized. When officers encounter such work, they should refer the matter to their Regional Managers who will arrange for the necessary expertise to advise them. (August 11, 1999).

Demolition

157 **(1)** No employer shall commence or continue to demolish a project until

(a) adequate steps have been taken to prevent injury to any person at or near the project or the adjoining property; and

(b) existing gas, water, electrical, steam and other services to the project have been disconnected or isolated.

(2) An employer shall ensure that

(a) an assessment of a building or other structure to be demolished is conducted to identify hazardous substances; and

(b) so far as is reasonably practicable, hazardous substances are removed prior to the demolition.

158 (1) Where a project, or any part thereof, being demolished is likely to endanger the safety of a person by its accidental collapse, an employer shall ensure that adequate measures are taken so that the project is adequately shored, braced or otherwise supported.

(2) Where a person may be endangered at or near a demolition project from falling or broken glass, an employer shall ensure that the glass is removed from windows and other locations in the project before demolition commences.

159 Where a hoist or powered mobile equipment is used during demolition, an employer shall ensure adequate supports are provided to ensure the stability of the hoist or powered mobile equipment.

160 An employer shall ensure that scaffolds are erected independent of that portion of a project that is being demolished.

161 (1) Except for demolition work performed in accordance with Section 165 or a demolition by explosives, an employer shall ensure that a demolition proceeds systematically from the highest to the lowest point of the project.

(2) Where a person may be endangered, an employer shall ensure that the work above each tier or floor is completed before the integrity of its supports is impaired by the demolition operations.

162 Following the completion of a demolition project, an employer shall ensure that

(a) the demolition area is fenced or barricaded;

(b) an excavation is backfilled to grade level; or

(c) an excavation is sloped to its angle of repose that is adequate.

163 Except for demolition work performed in accordance with Section 165, an employer at a demolition project shall ensure that

(a) no person disconnects a truss, girder or other member until it has been relieved of all loads, except its own weight, and given temporary support or lashed ready for lowering; and

(b) a hoist or other adequate equipment for the lowering of a truss, girder or beam is provided and used.

164 (1) Except for demolition work performed in accordance with Section 165, an employer at a demolition project shall ensure that masonry walls or any part of them are removed

(a) in reasonably level courses in any one storey; and

(b) so as not to endanger any person on the project.

(2) An employer at a demolition project shall ensure that masonry is not loosened or permitted to fall in such masses as to endanger the structural stability of a floor or other support of the project.

165 (1) In this Section, "demolition zone" means

(a) the area designated as such in writing by an engineer before the demolition begins; or

(b) in the absence of a designation under clause (a), the area having its centre at the point of demolition and having a horizontal radius equal to 1 ½ times the initial height of the project, or portion of the project being demolished.

(2) This Section applies to demolition by

(a) a heavy weight suspended by cable from a crane or other hoist; or
(b) a power shovel, bulldozer or other powered mobile equipment.

(3) An employer shall ensure that no person, other than persons directly engaged in the demolition, enters or remains within the demolition zone while the project is being demolished.

(4) Where a swinging weight is used for demolition, an employer shall ensure that the supporting cable is of such length or so restrained that the weight will not swing against any object other than the project being demolished.

(5) Where it is required to prevent the uncontrolled collapse of a project that may endanger a person at or near the workplace, an employer shall ensure that structural components are identified in an adequate manner to ensure the components are not removed

inadvertently.

(6) Where an operator of equipment referred to in subsection (2) cannot see where the material from the demolition will fall, the employer shall ensure that a signaller guides the operator.

(7) Where the demolition involves undercutting structural supports, an employer shall develop an adequate written procedure certified by an engineer for the demolition.

Part 14 - Excavations and Trenches

166 **(1)** Where a person may enter an excavation or trench and a wall of an excavation or trench is greater than 1.2 m in height, an employer shall ensure that the wall is supported by adequate shoring or bracing, or that an adequate trench cage is used, except where the employer is able to establish that the excavation or trench

1.2m = approximately 4 ft (April 26, 2000)

(a) is cut in sound and stable rock;

The following materials will not be considered sound and stable, unless an engineer certifies them to be sound and stable:
i) sand, ii) soil, iii) gravel, iv) any mixture of the above, v) strata that contains layers of any mixture of the above (April 11, 2000)

(b) is sloped

  (i) to within 1.2 m of the bottom of the excavation or trench, or

"Benches" would be allowed on the sides of trenches or walls, to achieve an "overall slope" as long as the individual benches were not so high or narrow as to be a hazard themselves (March 1, 2004)

  (ii) where soil overburden is located above an excavation or trench excavated in sound and stable rock, for the entire overburden,

and the slope does not exceed 1 m of vertical rise to each 1 m of horizontal run; or

approximately 3 ft vertical rise to each 3 ft horizontal run (April 26, 2000)

(c) is one that a person does not enter within a horizontal distance from the walls of the excavation or trench that is equal to the height of the walls.

(2) Where the walls or crests of an excavation or trench are cut in rock, an employer shall ensure that the walls and crests are adequately supported by rock bolts, wire mesh or other means of adequate protection, if necessary, to ensure safe working conditions.

(3) Where powered mobile equipment is used near the edge of an excavation or trench, an employer shall ensure that any shoring, bracing or caging for the excavation or trench is adequate to support the increased load.

(4) An employer shall ensure that the walls of an excavation or trench are stripped of loose rock or other material that could slide, roll or fall on a person in the excavation or trench and injure that person.

(5) Despite clause (1)(b), an employer may slope the walls of an excavation or trench at an angle that exceeds a 1 m vertical rise to each 1 m horizontal run where an engineer has certified in writing that the steeper slope will be stable and is not a hazard to a person in the excavation or trench.

Note: APENS has developed a standard "Soils Evaluation Letter" to be completed by an engineer certifying the slope meets the requirements of 166(5). Officers should check the letter for completeness, in particular:
Name and Signature of Inspecting Engineer
Location of Project and Specific Site
Observed Soil type
Depth of excavation walls at time of evaluation
Slope
Date and time of certification (validity date for evaluation).
Feb. 1, 2004

The engineer's certification for a steeper slope may be used for an excavation or trench. There is no requirement for the methods noted in 166(1) to be tried first. (August 1, 2004)

(6) An employer shall ensure that a utility pole, building or other structure is provided adequate support or removed if the utility pole, building or other structure may become unstable because of excavation or trenching activity.

167 No person shall enter an excavation or trench 1.2 m or more in depth unless an employer ensures that a ladder is installed that extends at least 1 m above the excavation or trench or some other adequate means of access and exit is provided

(a) that is no more than 15 m from where the person is working; or

This does not mean a ladder every 15 m. (approx. 50'), but that a person must be able to reach a ladder within 15 m. (April 11, 2000).

(b) where a trench cage is used, within the trench cage.

168 An employer shall ensure that excavated material is

(a) kept at least 1 m away from the edge of an excavation or trench, unless an engineer certifies a shorter distance as adequate; and

(b) located a sufficient distance from the edge of the excavation or trench to ensure the excavated material does not re-enter the excavation or trench.

169	(1)	An employer shall ensure that an excavation or trench in which a person works is kept reasonably free of water.	"Reasonably free" means the water does not constitute a hazard to the person(s) working in the trench. (April 11, 2000).
	(2)	Where a person may be exposed to a hazardous substance or to an oxygen rich atmosphere in an excavation or trench, an employer shall ensure that, before the person enters the excavation or trench, (a) testing is performed to determine the concentration of any hazardous gas vapour or dust and the concentration of oxygen in the atmosphere in the immediate area of the excavation or trench where the work is to be performed; and (b) adequate precautions are taken to reduce the risk of injury to a person.	
	(3)	No person shall store hazardous substances in an excavation or trench.	
	(4)	An employer shall provide, at or near the sides of all temporary excavations greater than 1.2 m in depth, fences, guards or barricades that prevent a person from falling into an excavation, and shall keep those fences, guards or barricades in place at all times, except where they interfere with the excavation or other work being done.	

170 (1) Where a trench cage is used in an excavation or trench, an engineer shall certify the design of the cage.

(2) An engineer shall include in the certified design required in subsection (1) information on

(a) the depth at which the trench cage may be used; and

(b) the manner in which the trench cage is to be installed, erected, used, maintained and dismantled.

(3) Where a trench cage is altered, repaired or otherwise modified in a manner that may affect the structural integrity of the cage, an employer shall ensure that it meets the requirements of these regulations and is certified by an engineer in accordance with subsections (1) and (2) prior to use after the alteration, repair or modification.

(4) Where the top of a trench cage is below ground level, an employer shall ensure that the soil above the cage is sloped in accordance with clause 166(1)(b).

171 (1) An employer shall ensure that a nameplate is permanently attached to a trench cage, in a location visible for inspection when the cage is in use, identifying the engineer that certified the design of the trench cage and the depth at which the cage may be used.

(2) An employer shall designate a competent person to inspect a trench cage before each day it is used to ensure that it does not have any defects or damage that may affect the structural integrity of the cage.

(3) Where an inspection required in subsection (2) identifies a defect or damage that affects the structural integrity of the trench cage, an employer shall remove the cage from service until it is repaired and re-certified in accordance with subsection 170(3).

For existing trench cages the owners must ensure compliance with all trench cage requirements despite the fact they were initially approved by the Department of Labour. If the original engineering certification of the old trench cage can be found and the certification meets the requirements of the regulations the cage need not be recertified. (April 11, 2000).

172 An employer shall ensure that, where a trench cage is used, the cage

(a) rests as close as possible to the bottom of the excavation or trench; and

(b) does not rest above the bottom of the excavation or trench more than the designed maximum height, or 900 mm, whichever is the lesser,

900mm = approximately 3 ft

unless an engineer certifying the design of the cage also certifies its use in the specific circumstances.

173 (1) An employer shall ensure that shoring or bracing for an excavation or trench

(a) complies with a design certified by an engineer; or

(b) is commercially manufactured.

(2) An employer shall ensure that any shoring or bracing for an excavation or trench is installed, erected, maintained and dismantled in accordance with the manufacturer's specifications or an engineer's specifications.

Part 15 - Surface Mine Workings

Interpretation

174 In this Part, "working face" means an area in a surface mine where consolidated or unconsolidated material is worked.

This Part includes pits and quarries. (June 10, 1999)

A surface mine includes any operation where rock, sand, gravel, minerals, coal etc. is removed from a surface deposit. It does not include an operation where the only activity is stockpiling and removing such materials. (April 11, 2000)

The requirements of Part 15 do not apply to mines, pits and quarries that were inactive and continue to be inactive at the time these regulations came into effect (May 1, 2000); however, should the sites become active all relevant requirements will apply (April 11, 2005)

Marking location and control of entry

175 An employer shall ensure that a surface mine is

- (a) marked and identified in an adequate manner; and
- (b) securely protected from inadvertent entry by a person where

  Examples of means of preventing inadvertent entry include: fencing, berming, sloping, planting (hedges), etc. (April 11, 2000)

  - (i) the surface mine constitutes a hazard by reason of its depth,

    At a depth of 3m (10 ft) or more an officer is to require compliance with (a) & (b). (June 11, 1999).

  - (ii) the approaches to or openings of the surface mine are not readily visible, or
  - (iii) the hazard caused by the surface mine is greater than the hazard caused by natural topographical features within 600 m of the working face.

    600m = approximately 650 yds. (April 26, 2000)

Roadways and vehicles

176 An employer shall ensure that a roadway at a surface mine used for the purpose of moving material to, from, or within a surface mine is designed, constructed and maintained

(a) to minimize hazards caused by slipping or skidding of vehicles;

(b) to enable vehicles to pass each other safely where the vehicles are required to pass each other, and with sufficient width to accommodate the proposed traffic; and

Roadways wider than 2.5 times the width of the widest vehicle that will travel on the roadway are deemed adequate. This distance refers to the travelway only and does not include shoulder barriers or other such structures. For example, if the width of the widest vehicle that will travel a roadway is 4.0m (about 13 ft), the travelway of the roadway must be 10.0m (about 33 ft)wide. (June 22, 1999.)

(c) so that grades do not exceed the design capacity of vehicles that are used on the roadway.

Grade refers to the slope or steepness of a surface - in this case a roadway. See S. 178 for a more complete explanation. (June 22, 1999).

177 Where, at the edge of a regularly used roadway in a surface mine, a drop-off greater than 3 m creates a hazard, an employer shall ensure that an adequate shoulder barrier is designed, constructed and maintained to prevent vehicles from inadvertently going off the road.

"regularly used"means used, on average, more than once every shift by any vehicle. (June 10, 1999).

"Drop off" means the point at which, if a vehicle left the road, it would reasonably be expected to fall before it came to a complete stop. (June 22, 1999).

The shoulder barrier shall be the length of the roadway where the drop off is greater than 3m (10 ft). (June 22, 1999).

178	**(1)**	**An employer shall ensure that the grade on roadways in a surface mine does not exceed 12% on any 300 m portion of the roadway unless**	**This section applies to all vehicles that travel the roadway. (June 10, 1999).** **Grade refers to slope or steepness of a surface. The grade may not exceed 12% on any 300m (approximately 325 yds) portion. (April 11, 2000).** **All of the subsections - (a), (b) and (c)- must be complied with. (June 10, 1999).**
	(a)	**a written procedure for handling vehicle runaways has been prepared;**	
	(b)	**where reasonably practicable, runaway lanes, retardation barriers or vehicle modifications are adequately in place; and**	**"Vehicle modifications" are those modifications specified or allowed by the manufacturer that will permit the vehicle to operate under the conditions of the roadway. (April 11, 2000).**
	(c)	**the employer ensures that the vehicle manufacturer's specifications are followed.**	**If the employer does not have the manufacturer's specifications, the vehicle cannot be used on a roadway with a grade of greater than 12% over 300 m until the manufactures's specifications are obtained. This section does not allow an engineer to create the specifications. (April 11, 2000).**
	(2)	**Where no manufacturer's specifications are available for a vehicle used on a roadway in a surface mine, an employer shall ensure that the grade on roadways in a surface mine does not exceed 12% on a roadway length that exceeds 300 m.**	

179 An employer shall ensure that every person who is a pedestrian at a surface mine in an area of operating mobile equipment wears high visibility warning clothing to ensure that the pedestrian is visible to a person operating mobile equipment.

"Clothing" includes such items as: vests, overalls, gloves, hard hats, etc. (April 11, 2000).

"High visibility" is not simply bright colours, it should have some reflective quality and may include the use of reflective tape. It is not required to meet ANSI/ISEA 107-1999 - American National Standard for High-Visibility Safety Apparel (April 11, 2000).

Note: if employers choose to use reflective adhesive tape on hard hats, the standards called up in section 11 will require the manufacturer of the hard had to approve the tape. (April 11, 2000)

180 Where material excavated from a surface mine is dumped from a vehicle onto a stockpile, an employer shall ensure that adequate precautions are taken to ensure that the vehicle does not overturn.

"adequate precautions" shall include:
-where the vehicle travels on the stockpile, the stockpile is designed by an engineer so as to prevent vehicle overturn
-a written procedure for the movement of material to the stockpile that will alert the operator of the machine of the proximity of the edge of the stockpile. (June 15, 1999).

Overburden

181 An employer shall ensure that unconsolidated overburden at a surface mine

(a) is moved a sufficient distance away from the edge of the surface mine to prevent the overburden from falling into the surface mine;

(b) if less than 7 m away from the edge of a surface mine that is greater than 1.2 m deep and in which a person is or may be present, is approved by an engineer to ensure that the distance is adequate to prevent the overburden from falling into the surface mine; and

7m = approximately 23 ft; 1.2m = approximately 4 ft.

(b) is sloped to its angle of repose.

"Angle of repose" is the angle which the unconsolidated overburden will take after weathering. (April 11, 2000).

Notice of operation

182 When activities in a surface mine are initially started, or when activities are resumed after a cessation of operation of 4 months or more, an employer shall

(a) notify the Director in writing of the intention to begin or resume operations in the surface mine at least 2 weeks before the operations are to begin or resume;

(b) specify in the written notice to the Director the geographic location of the surface mine; and

(c) state the estimated start-up date and period of operation.

"activities" means any new extraction from the body to be mined. This includes associated processing of the material. (April 11, 2000).

If the employer enquires as to the type of geographic information to include in the notice, the officer is to advise that it is preferred that the longitude and latitude be included to create a unique identifier for the location. (June 15, 1999).

Inspections

183	**(1)**	No person shall begin work, other than at a stockpile, at or near a working face in a surface mine (a) following a blast; or (b) at the beginning of each operating shift, until a designated competent person inspects the working face to ensure that the working face is adequate.	"Near" a working face, would be the distance whereby a hazard of being buried or struck by any material falling from working face is possible. (April 11, 2000). The inspection is to include, but is not limited to, the identification of any explosives that have not exploded and the identification of any instability in the walls of the working face. (June 10, 1999). If the inspection is carried out following a blast, one of the persons carrying out the inspection must be the individual who was in charge of the blast. Another competent person may be required to inspect for ground control issues. Therefore, more than one person may be required to carry out the inspection. (June 10, 1999). The "or" in this particular section is to be interpreted as requiring an inspection of the working face by a competent person after the occurrence of each event (the blast, or, the beginning of a shift) (Feb 1, 2004)
	(2)	The competent person referred to in subsection (1) shall record the results of the inspection required by subsection (1) in a daily examination and record book and shall record all unusual occurrences or hazards.	Conditions in general (not just unusual occurrences or hazards) must be recorded as well. (June 22, 1999). Any unusual occurrences or hazards identified shall be addressed in an appropriate time frame (June 22, 1999). Where more than one competent person carried out the inspection, all must sign the record book. (June 10, 1999).
	(3)	The competent person referred to in subsection (1) shall read the record in the daily examination and record book made for the previous shift and sign it before work at the face begins on the next shift.	
	(4)	An employer shall make available the daily examination and record book referred to in subsections (2) and (3) on request to the committee or the representative, if any.	

Walls or working face

184 **(1)** Subject to subsection (3), where a wall or working face of a surface mine is greater than 20 m in height, an employer shall ensure that the surface mine is designed, constructed and maintained with the wall or working face benched and having a vertical rise not in excess of 20 m for every horizontal run not less than 8 m.

Subject to Sub-section (3), a wall greater than 20m (65 ft) with a slope over 68 degrees is required to be benched. The bench must be wide enough to catch loose rocks falling from the wall. (August 11, 1999).

A bench must have 2m (6.5 ft) from the edge back that is clear of debris.(June 22, 1999).

(2) Where a wall or working face of a surface mine is 20 m in height or less and the wall or working face cannot be excavated in a safe manner, an employer shall ensure that the wall or working face is adequately benched to ensure the work can be performed in a safe manner.

(3) Where a wall or working face of a surface mine is greater than 20 m in height and it is not benched in accordance with subsection (1), an employer shall ensure that

The employer must comply with only one of these requirements. (June 10, 1999).

(a) an engineer has certified the wall or working face height as adequate;

(b) subject to subsection (4), material extracted is removed by means of equipment located at the top of the wall or working face; or

See section 166(3) requirements where powered mobile equipment is used near the edge of an excavation. (June 22, 1999).

(c) when work is required to be performed within a radius of 1.3 times the height of the wall or working face, a procedure is developed to ensure the work is performed safely.

(4) An employer shall ensure that no material is removed in accordance with clause (3)(b) where a person is present in a surface mine in an area where they could be struck by an object dislodged by the equipment.

Work procedures

185 Where unconsolidated material is being worked or removed, an employer shall ensure that the vertical height of the unconsolidated material is not more than 1.5 m above the maximum reach of the equipment being used to work or remove the unconsolidated material, unless the work is done in accordance with written specifications and a written safe work procedure certified by,

1.5m = approximately 5 ft

(a) in the case where there is a possibility that the material could collapse onto the equipment or a person, an engineer, following consultation with the committee or representative, if any; or

(b) in the case where there is no possibility that the material could collapse onto the equipment or a person, a competent person, following consultation with the committee or representative, if any.

186 (1) Where material in a surface mine is being worked by means of powered mobile equipment, an employer shall ensure that the working face is sloped to a maximum grade of one unit of vertical rise for every equal unit of horizontal run during periods of inactivity that exceed a period of 4 months.

(2) Where material in a surface mine is being worked by means of powered mobile equipment, an employer shall ensure that

(a) the working face extends not more than 1.5 m above the maximum reach of the equipment in use; or

(b) the work is performed in accordance with written specifications and a written safe work procedure certified by,

(i) in the case where there is a possibility that the material could collapse onto the powered mobile equipment, an engineer, following consultation with the committee or representative, if any, or

(ii) in the case where there is no possibility that the material could collapse onto the powered mobile equipment, a competent person following consultation with the committee or representative, if

The intent of this section is to have it apply to both stockpiles and the working face. If the working face is to be inactive for a period exceeding four months then it needs to be sloped to 45 degrees - exceptions will require a deviation (Feb. 1, 2004) any.

187 Where undercutting or undermining is performed at the working face of a surface mine by means of powered mobile equipment, an employer shall ensure that the undercutting or undermining is

(a) restricted to the depth of the bucket of the powered mobile equipment; and

(b) permitted only when

  (i) the approach by the operator of the powered mobile equipment is at a 90° angle to the working face; and

  (ii) the work is performed in accordance with specifications and a written safe work procedure certified by a competent person in consultation with the committee, or representative, if any.

Section 185 applies as undercutting creates the potential hazard of material collapsing onto the equipment. (June 22, 1999).

188 Where unconsolidated material in a surface mine is being worked by means other than powered mobile equipment, an employer shall ensure that

- (a) the working face is sloped at its angle of repose;
- (b) the vertical portion of the working face does not exceed a maximum grade of one unit of vertical rise for every equal unit of horizontal run; or
- (c) the work is performed in accordance with written specifications and a written safe work procedure certified by,
  - (i) in the case where there is a possibility that the material could collapse onto a person, an engineer, following consultation with the committee or representative, if any, or
  - (ii) in the case where there is no possibility that the material could collapse onto a person, a competent person, following consultation with the committee or representative, if any.

189 Where unconsolidated material is being worked at a working face, an employer shall ensure that no person comes closer to the working face than 1.3 times the height of the working face, unless

- (a) the working face is sloped at its angle of repose;
- (b) the working face is benched to limit the vertical height of the working face to not more than 1.2 m and the grade above the horizontal portion does not exceed one unit of vertical rise for every equal unit of horizontal run; or
- (c) the work is performed in accordance with written specifications and a written safe work procedure certified as adequate by
  - (i) in the case where there is a possibility that the material will collapse onto a person, an engineer, following consultation with the committee or representative, if any, or
  - (ii) in the case where there is no possibility that the material will collapse onto a person, a competent person, following consultation with the committee or representative, if any.

Where this situation exists in a surface mine, the intent is to treat the situation in a similar fashion as trenches - Section 166 through 173; 1.2m = approximately 4 ft

Part 16 - Equipment for Firefighters

Application and interpretation

190 (1) This Part does not apply to an underground mine.

(2) Where there is a conflict between this Part and another Section of these regulations, this Part prevails to the extent of the inconsistency.

Protective headwear

191 (1) When engaged in structural fire-fighting, a firefighter shall use protective headwear that complies with or exceeds NFPA standard NFPA 1971, "Standard on Protective Ensemble for Fire Fighting", 1997 edition.

See definition of "structural fire-fighting" in S. 2(ab). (June 10, 1999).

Volunteer fire fighters are not covered by the regulation. For a discussion of coverage of volunteers by OH&S legislation see the Reference Guide to the *Occupational Health and Safety Act* Appendix A. (June 22, 1999).

(2) An employer shall ensure that attachments to and on the protective headwear referred to in subsection (1) are made only in the manner specified by the manufacturers of the headwear.

Attachments include shields, chinstrap, lights. (June 10, 1999.)

Protective footwear

192 When engaged in structural fire-fighting, a firefighter shall use protective footwear that

(a) complies with or exceeds NFPA standard NFPA 1971, "Standard on Protective Ensemble for Fire Fighting", 1997 edition or the standard for Grade 1 footwear, with sole puncture protection and electric shock resistant soles in CSA standard CAN/CSA-Z195-M92, "Protective Footwear";

(b) is water-resistant for at least 12.7 cm above the bottom of the heel; and

Water resistant includes rubber and water resistant leather. (June 10, 1999)

(c) has a slip-resistant outer sole.

Protective handwear

193 When engaged in structural fire-fighting, a firefighter shall wear protective handwear that complies with or exceeds NFPA standard NFPA 1971, "Standard on Protective Ensemble for Fire Fighting", 1997 edition.

Protective coat and trousers

194 When engaged in structural fire-fighting, a firefighter shall wear a protective coat and trousers that

(a) comply with or exceed NFPA standard NFPA 1971, "Standard on Protective Ensemble for Fire Fighting", 1997 edition or CGSB standard CAN155.1-98, "Fire Fighter's Protective Clothing for Protection Against Heat and Flame", and

(b) fit properly in sleeve length, coat length, chest girth, waist girth, trouser inseam length and crotch rise so as to prevent unsafe situations resulting from the interference of one piece of clothing or equipment with another.

The fire fighter's clothing must fit so that no skin or street clothing is exposed when they are engaged in fire fighting activities. (June 10, 1999.)

Clothing that is too big or too small presents a hazard. (April 11, 2000)

Respiratory protective equipment

195 **(1)** A firefighter who may be exposed to an oxygen deficient atmosphere or to harmful concentrations of air contaminants when engaged in structural fire-fighting shall wear positive-pressure self-contained respiratory protective equipment that complies with or exceeds NFPA standard NFPA 1981, "Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service" 1997 edition, together with a protective hood that complies with or exceeds the requirements in NFPA standard NFPA 1971, "Standard for Protective Ensemble for Fire Fighting", 1997 edition.

"Engaged in structural fire-fighting" includes the period post the extinguishing of flames where fire fighters continue fire fighting related activities. Therefore, they would be required to continue wearing the self-contained respiratory protective equipment until the concentrations of air contaminants are no longer harmful. (June 10, 1999).

(2) An employer shall ensure that a firefighter who is wearing self-contained respiratory protective equipment when engaged in structural fire-fighting is accompanied by another firefighter similarly equipped and having the same air capacity.

(3) An employer shall ensure that self-contained respiratory protective equipment used by a firefighter when engaged in structural fire-fighting is equipped with a personal distress alarm device that complies with or exceeds NFPA standard NFPA 1982, "Standard on Personal Alert Safety Systems (PASS) for Fire Fighters", 1998 edition.

A "personal distress alarm" is commonly known as a "man down alarm". The alarm will activate if the fire fighter remains motionless for a specified period of time. (June 22, 1999).

196 An employer shall ensure that firefighters receive annual quantitative fit testing of their self-contained respiratory protective equipment.

Body harnesses and safety ropes

197 **(1)** In this Section and Sections 198 and 199,

(a) "body harness" means a harness consisting of leg and shoulder straps and an upper back suspension unit that will distribute and reduce the impact force of any fall; and

(b) "confined space" means a confined space as defined in subsection 129(1).

(2) A firefighter entering a confined space for the purposes of rescue shall wear a body harness that complies with or exceeds NFPA standard NFPA 1983, "Standard on Fire Service Life Safety Rope and System Components", 1995 edition, and self-contained respiratory protective equipment that complies with or exceeds NFPA standard NFPA 1981, "Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service", 1997 edition.

198 **(1)** An employer shall ensure that ropes and associated body harnesses and hardware used by a firefighter for structural fire-fighting or rescue purposes comply with or exceed NFPA standard NFPA 1983, "Standard on Fire Service Life Safety Rope and System Components", 1995 edition.

(2) When working from an aerial device, as defined in subsection 201(1), a firefighter engaged in structural fire-fighting or rescue shall use a body harness that complies with or exceeds NFPA standard NFPA 1983, "Standard on Fire Service Life Safety Rope and System Components", 1995 edition.

(3) Despite subsection (1) or (2), or any provision of the *Fall Protection and Scaffolding Regulations*, in a situation where those regulations would require the use of a body harness or associated ropes and hardware complying with a different standard, it is permissible to use equipment that meets the requirements of either subsection (1) and (2) or the *Fall Protection and Scaffolding Regulations*.

199 Where a body harness has been used by a firefighter for structural firefighting or rescue, the employer shall ensure that the body harness is not used again until it is inspected by a designated competent person to ensure all components are in an adequate condition.

Note: "used" does not only mean used to limit a fall; "used" means worn. (April 11, 2000)

Portable ladders

200 Where a portable ground ladder is used for structural fire-fighting, an employer shall ensure that it complies with or exceeds NFPA standard NFPA 1931, "Standard on Design of and Design Verification Tests for Fire Department Ground Ladders", 1999 edition, and is used, maintained and tested in accordance with NFPA standard NFPA 1932, "Standard on Use, Maintenance and Service Testing of Fire Department Ground Ladders", 1999 edition.

Aerial devices

201 **(1)** In this Section, "aerial device" includes an aerial bucket, aerial ladder, elevating platform, aerial ladder platform or water tower that is designed to position personnel, handle materials, provide a means of exit or discharge water, as the case may be.

(2) Where an aerial device is used for structural fire-fighting, an employer shall ensure that it

(a) complies with or exceeds NFPA standard NFPA 1914, "Standard for Testing Fire Department Aerial Devices", 1997 edition or Underwriters' Laboratories of Canada standard CAN/ULC - S515 - 1988, "Automobile Fire Fighting Apparatus", or

(b) is certified in writing by an engineer as being safe to elevate a firefighter to a work site above ground when used for structural fire-fighting purposes.

Battery powered lights

202 An employer shall ensure that each fire truck is equipped with 2 portable intrinsically safe hand lights, each of which is powered with at least a 6-volt battery.

Industrial firefighters

203	(1)	Where an employer establishes an internal fire-fighting unit at its place of business, the employer shall ensure that industrial firefighters designated to take part in fire-fighting activity have received adequate training.	See clause 9(2)(a) for information on training and associated costs (December 14, 2000)
	(2)	An employer shall ensure that industrial firefighters do not engage in structural fire-fighting beyond the incipient stages unless wearing and using the personal protective equipment required by Sections 191 to 199.	"Incipient" means the initial or beginning stages of a fire. (April 11, 2000).
	(3)	An industrial firefighter shall not engage in structural fire-fighting beyond the incipient stages unless wearing and using the personal protective equipment required by Sections 191 to 199.	
	(4)	An employer shall ensure that beyond the incipient stages of a fire, fire-fighting by industrial firefighters conforms to NFPA standard NFPA 600, "Standard on Industrial Fire Brigades", 2000 edition.	An officer would normally look for documentation that a person is 'fit' to perform assigned tasks. The medical examination required by NFPA 600 should include adequate information to allow the evaluator to come to a conclusion regarding the fitness of an individual to perform tasks reasonably expected of an industrial firefighter. These include consideration of duties assigned to an individual employee, assessment of the cardiovascular system, assessment of the respiratory system, assessment of the visual acuity, assessment of the auditory system and consideration of any existing acute or chronic medical condition that may adversely affect the employee's ability to perform the duties assigned. The medical assessment should be developed by, or reviewed by, a physician licensed to practice in the province. The assessment needs to be conducted by a qualified health professional competent to administer the assesssment. The evaluation needs to be signed by the conducting professional and needs to include an opinion on the fitness of the individual to perform the duties of an industrial firefighter. (July 20, 2001)

Amendments to the Regulations

The Governor in Council on the report and recommendation of the Minister of Labour dated , 1999, pursuant to subsection 82(1) of Chapter 7 of the Statutes of Nova Scotia, 1996, the *Occupational Health and Safety Act*, is pleased to:

(a) repeal the *Construction Safety Regulations* made by Order in Council 68-104 on February 12, 1968, effective on, from and after October 1, 1999, except Sections 1, 66, 68 and 82, which are repealed effective on, from and after the date of this Order;

(b) repeal the *Industrial Safety Regulations* made by Order in Council 69-127 on February 11, 1969, effective on, from and after October 1, 1999, except Sections 1 and 249, which are repealed effective on, from and after the date of this Order;

(c) make regulations respecting occupational safety general requirements in the form set forth in Schedule "A" attached to and forming part of the Report and Recommendation, effective on, from and after October 1, 1999, except for Sections 158 and 165 which are effective on, from and after the date of this Order.

APPENDIX A (May 7, 1999)

GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **CGA P-1-1991, "Safe Handling of Compressed Gases in Containers"**

Reference: Section 45(2) - Compressed Gas

45(2) For the purpose of subsection (1), Compressed Gas Association standard CGA P-1-1991, "Safe Handling of Compressed Gases in Containers", is presumed to indicate the required standard of reasonable care, unless an employer proves that this is not reasonably practicable in a particular circumstance.

Scope: Sets standards for the handling the handling of compressed gases in portable containers only. Fixed or stationary tanks are not covered. Rail cars are covered.

Excluded sections: All sections are included in the regulation.

Substantive points for Officers:

3.2.5 The primary identifier of container contents is the label. Colour shall not be used to determine container contents.

3.2.6 Containers not bearing a legibly written, stamped or stencilled identification of contents shall not be used.

3.4.1 Where provided by the gas manufacturer, the user shall keep valve protection caps in place at all times, except when containers are secured and connected to dispensing equipment

3.4.2 Where provided by the gas manufacturer, the user shall keep valve outlet caps or plugs in place at all times, except when containers are secured and connected to dispensing equipment

3.7.2.1 Container storage areas shall not exceed 125°F (51.7°C)

3.7.2.2 Containers shall not be stored near elevators, walkways, unprotected platform edges or in areas where heavy moving objects may strike them

3.7.3.1 If the gas manufacture recommends storage in the shade, the user shall ensure containers are stored in the shade

3.7.4.1 All compressed gas cylinders shall be secured to prevent falling. Note that this applies to all sizes. Note also it only applies to cylinders. Spheres of compressed gas do not need to be secured.

Gas cylinders less than 5 l in capacity may be stored horizontally if properly secured.

3.8.1 The container valve shall be kept closed at all times except when the cylinder is in use.

3.8.2 Check valves and/or traps must be used where the possibility of backflow exists

3.8.7 Regulators, gauges, hoses and other apparatus provided for use with a particular gas or group of gases shall not be used on gas containers having different chemical properties unless approved by the gas manufacturer

3.10 An emergency response plan shall be implemented wherever compressed gas containers are used, handled or stored. Although not explicitly required by the standard, officers shall look for this plan to be in writing.

3.10.1 Only qualified and knowledgeable personnel shall respond to a compressed gas cylinders emergency

3.10.2 During a compressed gas container emergency, personnel shall be promptly evacuated from the immediate danger area and kept upwind at a safe distance to avoid inhalation of or contact with the gas

3.10.4.1 Where respiratory protection is required during emergencies involving toxic, corrosive or asphyxiant gases, only positive pressure self contained breathing apparatus shall be used, and only where a minimum of 2 such units is on site, one of which shall be in the possession of a qualified back-up person present at the site.

4.2.1.5 Portable fire extinguishers (carbon dioxide or dry chemical) shall be available for emergencies at storage locations. "No smoking" signs shall be posted around storage areas.

4.2.4.1 Flammable gas containers stored inside shall be kept at least 20 feet (6.1 m) flammable liquids, highly combustible materials and oxidizers and not near arcing electrical equipment, open flame or other ignition sources.

4.2.4.2 Maximum storage capacities inside are:
- 2 500 cubic feet (70.79 cubic metres) of acetylene or non-liquified flammable gas
- 309 pounds (140.2 kg) of propane
- 375 pounds (170.1 kg) of butane

4.4.4 Oxygen, chlorine, fluorine, nitrous oxide and other flammable gases shall be stored at least 20 feet (6.1 m) away from flammable gas containers or combustible materials or separated from the flammables by a 5 foot high wall with a 30 minute fire resistance

4.5.2.1 Areas where containers of ammonia, fluorine, sulphur dioxide or other corrosive gases are filled or utilized shall be equipped with emergency eyewash showers and eyewash fountains.

4.5.2.4.1 Storage of toxic or corrosive gases (i.e. ammonia, fluorine, sulphur dioxide, carbon monoxide, nitric oxide and nitrogen dioxide) shall be outdoors or in a separate building or room with other occupancy and of non-combustible construction with a fire rating of at least 1 hour

5.4 Before unloading a tank car, the user shall confirm the identity of the contents. This process would involve a test of some kind. Simply looking at the bill of lading or placard would not be adequate.

5.6 Derails or other appropriate devices shall be placed at both ends of an unloading track where liquified compressed gases are being unloaded to prevent intrusion of other rail cars. The rail car being unloaded shall be grounded (note, the steel wheels on the railway track is not a ground).

Other points:

APPENDIX B (August 6, 1999)
GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **CSA B167-96: "Safety Standard for Maintenance and Inspection of Overhead Cranes, Gantry Cranes, Monorails, Hoists and Trolleys"**

Reference: Section 72 - Hoists

72 An employer shall ensure that a hoist is designed, installed, erected, examined, inspected, tested, operated and maintained in accordance with the applicable CSA or ANSI standard listed below:

(a) CSA standard B167-96, "Safety Standard for Maintenance and Inspection of Overhead Cranes, Gantry Cranes, Monorails, Hoists, and Trolleys";

Scope: Sets standards for the maintenance, testing and inspection of overhead Cranes, Gantry Cranes, Monorails, Hoists, Jib Cranes, Wall Cranes, Trolleys and other equipment having the same fundamental characteristics

Excluded sections: Entire standard is included in regulation.

Substantive points for Officers:

1.2 A crane log shall be kept readily available.

4.1 A crane inspector shall have a minimum of 10,000 hours of experience in inspection, maintenance, repairs and modifications of these types of cranes. This shall include training in and knowledge of applicable legislation, safety practices, and standards. It is acceptable that crane inspection be performed by a team having combined equivalent qualifications under the supervision of a crane inspector or professional engineer.

4.2 Critical components shall be inspected in accordance with criteria or procedures established by the manufacturer. In the absence of such criteria, or in the event of doubt as to the criticality of a component, an engineer shall maker a list of critical components and corresponding criteria and procedures for each critical component.

4.3 A dated and signed report shall be kept in the log book on critical components.

4.4.1.1 Prior to use, all new, reinstalled, modified or rebuilt equipment shall be inspected by a crane inspector and the supporting structure shall be approved by an engineer (see also 4.4.5.2)

4.4.4.1 Visual inspections shall be recorded in the log book. The minimum inspection frequency shall be weekly for cranes handling near their capacities on a frequent (more than daily) basis; monthly in all other cases

4.4.4.2 Visual inspections shall consider:
- all operational functions
- leakages
- deformation, wear and cracks
- hooks, latches, and ropes
- limit devices
- function labels for operator control
- brakes

4.4.5.1 Visual inspections by a crane inspector shall be made quarterly for cranes handling near their capacities on a frequent (more than daily) basis; semi-annually for cranes that regularly handle half their rated capacity; annually in all other cases

4.4.5.3 Lists the 16 items to be checked under 4.4.5.1.

5.1 Prior to use, all new, reinstalled, modified or rebuilt equipment shall be tested for the following functions:
- all motions
- limit switches at full speed
- limiting and indicating devices
- all circuits, controls, interlocks, sequences
- each crane motion at 100% of rated load and at 125% of the rated load

The test results are to be recorded in the crane log

6.1 All repairs are to be performed or supervised by a person having at least 8,000 hours of experience repairing these times of cranes

6.2.1 A preventive maintenance program shall be established and dated and signed records kept.

6.2.2 Replacement parts shall meet or exceed the original manufacturer's specifications.

Other points:

1) The standard contains a lot of information on manufacturing requirements that have not been summarized above. For information on these areas, please see the standard itself.

APPENDIX C (May 7, 1999)

GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **CSA Z150-1974: "Safety Code for Mobile Cranes" and Supplement No. 1-1977 to CSA Standard Z150-1974: "Safety Code for Mobile Cranes"**

Reference: Section 72(c) - Hoists

72 An employer shall ensure that a hoist is designed, installed, erected, examined, inspected, tested, operated and maintained in accordance with the applicable CSA or ANSI standard listed below:

(c) CSA standard Z150-1998, "Safety Code for Mobile Cranes";

Scope: Sets standards for the design, construction, load rating, installation, erection, inspection, maintenance, repair, modification, test and operation of mobile cranes. Includes only machines with the following characteristics:

1) crane is mounted on a mobile base
2) crane is designed and manufactured primarily for hoisting by means of a tackle suspended from a boom
3) the boom is lattice or telescopic and can rise/lower vertically and rotate horizontally (thus a backhoe, which is mobile and can hoist, is not covered by this standard)
4) the tackle is suspended from the boom and can be increased and diminished in length.

Specifically includes crawler-mounted cranes, commercial truck-mounted cranes, boom trucks and wheel-carrier mounted cranes.

Standard only applies when the machines are being used for hoisting.

Does not apply to:

- machines within the scope which have been converted to excavating work (draglines, shovels, etc.)
- articulating boom cranes
- hydraulic and cable-operated excavating equipment (backhoes, power shovels)
- cranes designed to clear railway and automobile wrecks
- side boom tractors used on pipelines
- mobile cranes used specifically for power line work
- vehicle-mounted aerial devices (sign trucks) to which CSA 225 applies (CSA 225 is the standard specifically for vehicle-mounted aerial devices)
- trolley boom cranes
- truck-mounted gantry, overhead and bridge cranes
- stacker cranes
- self-propelled elevating work platforms (four other CSA standards apply in this area)
- forklift trucks equipped with booms
- tower cranes

Excluded sections: Entire standard is included in regulation.

Substantive points for Officers:

1.7 Specifies that "shall" indicates a mandatory requirement; "should" indicates a recommendation the advisability of which depends on the situation

Clause 3, which sets construction and characteristics of lattice and telescopic boom mobile cranes, applies only to cranes manufactured after January 1, 1999.

3.1.1.4 No load shall be lifted over the front area of a truck mounted crane, except as allowed by the manufacturer and noted in the load chart

3.1.3.1 A load chart shall be affixed in the crane cab accessible to the operator. It shall note:
- load ratings at all radii, angles, work areas, boom lengths
- crane model and serial number

- adequate warning that wind, swinging loads, tire inflation, etc. is not allowed for in the load ratings
- any information on limitations in boom length or angle
- information on operating at low temperatures
- location of tipping points
- essential warning notes
- size of outrigger pads or ground bearing pressure

3.1.3.3 A manufacturer's manual shall be kept in the crane cab

3.7.6.2 All hooks shall be permanently labeled with their rated capacities

3.7.6.3 load hooks shall be equipped with a swivel and a safety latch

4.1.2 Complete and concise information on inspections, tests, maintenance and repairs that have a bearing on crane safety shall be kept in the crane log

4.2.2.2 Crane log shall show in detail all inspections, tests, maintenance, repairs, revisions and modifications, along with date of the work, name of the person doing the work and the number of hours of crane service up to that point

4.2.2.4 All incidents, damage and subsequent repairs shall be recorded in the crane log

4.3 Cranes shall be inspected daily, at 3 month or 350 hour intervals, annually and after 10 years or 10,000 hours. The standard details items to be covered in each inspection.

4.5.1.1 A preventive maintenance program, based on manufacturer's recommendations, shall be established and dated records kept.

4.5.1.2 Manufacturer's replacement parts shall be used where possible. where not possible, replacement parts shall meet or exceed manufacturer's specifications

5.1.1(d) The management shall tell the operator the weight of the load that is to be lifted

5.1.3.1 Cranes shall not be operated over areas the public has access to unless there is no alternative and an overhead protection is provided

5.1.3.3 The overhead protection in 5.1.3.1 shall be designed by an engineer.

5.1.3.4 Cranes shall not work in overlapping areas if possible. If they must overlap, the operators shall establish and use cross-communication

5.1.4.6 On cranes with outriggers, unless all wheels are fully off the ground, the "on tires" rating shall be used

5.4.1.4 No person other than the operator shall board, leave or ride the crane when it is in operation or motion

5.4.1.6 No person shall be permitted within the radius of the crane unless authorized

5.4.1.8 No internal combustion engine shall be operated:
- in an excavation, unless there is adequate ventilation
- in a building or enclosed structure, unless there is an adequate supply of air

5.4.1.9(i) The operator shall know the weight of the load

5.4.1.9(k) The operator shall have a clear view or have a signaler

5.4.1.9(m) The operator shall respond only to signals from a designated signaler, except for a stop signal which anyone may give

5.4.1.9(n) The operator shall not leave the controls while a load is suspended

5.4.2.1 Before leaving the crane unattended, the operator shall:
- land any load
- set all brakes and locking devices
- secure the unit against inadvertent travel
- lock the doors to prevent unauthorized access

5.4.7.1.1 No person shall be lifted in a basket unless there is no practical alternative

5.4.7.2.1(c) The platform to lift a worker shall be designed by an engineer

5.4.7.2.2(a) A crane used as a personnel lifting device shall be downrated to half its capacity

5.4.8.1 A crane operating within a boom length of the minimum approach distance to a power line shall be guided by a signaler

5.5.3 A signaler shall be visually differentiated from other workers

5.5.4 Hand signals shall be in accordance with those listed in the standard

Other points:

1) The standard contains a lot of information on manufacturing requirements that have not been summarized above. For information on these areas, please see the standard itself.

APPENDIX D (May 7, 1999)

GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **CSA Z248-1975: "Code for Tower Cranes"**

Reference: Section 72(d) - Hoists

72 An employer shall ensure that a hoist is designed, installed, erected, examined, inspected, tested, operated and maintained in accordance with the applicable CSA or ANSI standard listed below:

(d) CSA Standard Z248-1975, "Code for Tower Cranes";

Scope: Sets standards for the design, manufacture, installation, operation, inspection, testing, maintenance and repair of tower cranes. Includes climbing, stationary and travelling tower cranes.
Does not apply to cranes in categories besides tower cranes or to mobile cranes outfitted as tower cranes.

Excluded sections: Entire standard is included in regulation.

Substantive points for Officers:

3.3.2 Plate or diagram showing rated loads and radii shall be mounted in a place visible to the operator.
3.3.3 Working instructions shall be available at the operator's station (also 4.10.6)
3.3.5 A plate shall be mounted showing the proper hoisting and rigging rope characteristics
4.5.2 A hoisting rope data tag shall be provided in a conspicuous location showing hoisting rope diameter, breaking strength and other data
4.13.1 Hooks shall be equipped with safety latches
4.13.1 Maximum load of hooks shall be clearly marked (note that this goes beyond ASME B30.10-1993: "Hooks" which does not require load data on hooks)
6.2.1.2 A crane log shall be kept readily available.
6.2.2.2 The crane log shall show details of all inspections, tests, maintenance, repairs, revisions and modifications that have a direct bearing on crane safety
6.2.2.3 All entries in the log shall be dated and signed by the person doing the work
6.3.1 Before being put in service, a crane shall be inspected by the supplier's representative accompanied by the regular operator.
6.4.4 A standard lift test shall be performed before the crane is put in service and after any substantial alterations or repairs
6.4.5 The manufacturer's maintenance procedures shall be carried out.
6.5.8 All servicing shall be performed by competent people experienced in the type of crane they are servicing.
6.6.1.1 A complete inspection of all ropes shall be made monthly and recorded in the crane log. Any deterioration shall be carefully noted, along with a determination of whether the deterioration constitutes a hazard.
6.6.1.2 Running ropes shall be removed from service if:
- 6 wires are broken in one lay, or 3 in one strand
- wear exceeds 1/3 or the original diameter
- there is evidence of kinking, birdcaging or other damage
- there are reduction in rope diameter beyond listed limits.

6.6.1.3 Standing ropes shall be removed from service if there are 3 or more broken wires in one lay, in sections between connectors or more than 1 broken wire at an end connector
7.3 Each operator shall have in his possession a log book showing the operator's:
- training and
- experience on cranes and related work

7.5.4 Tower crane operation shall be suspended when the temperature reaches the point where the manufacturer says operation is unsafe. If the absence of a manufacturer's recommendation, operations shall be suspended at -18°C.
7.6.8(e) It is forbidden to use a crane for demolition where impact would be imposed.
7.6.17 Operating manuals shall be on the job site at all times.
7.7.1 No unauthorized person shall be permitted within the operating radius of a crane

7.7.2 Except for a “Stop” signal, an operator shall only respond to signals from a signalman. A “Stop” signal from any person shall be obeyed.

7.7.4 Movement of a crane shall only be made in response to a signal.

7.8.3 Signalmen shall wear conspicuous gloves (such as flourescent orange). No other person shall wear similar gloves.

7.8.4 Signalmen shall use the signals illustrated in the standard (see attached)

Other points:

1) The standard contains a lot of information on manufacturing requirements and erection requirements that have not been summarized above. For information on these areas, please see the standard itself.

APPENDIX E (April 26, 2000)

GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **ANSI/ALI ALCTV-1998, "Standard for Automotive Lifts - Safety Requirements for the Construction, Testing and Validation"**

Reference: Section 72(e) - Hoists

72 An employer shall ensure that a hoist is designed, installed, erected, examined, inspected, tested, operated and maintained in accordance with the applicable CSA or ANSI standard listed below:

(e) ANSI standard ANSI/ALI B153.1-1990, "American National Standard For Automotive Lifts - Safety Requirements for the Construction, Care, and Use"

Scope: The Standard covers safety requirements for the construction, testing and validation of automotive lifts. Includes only those lifts that are located in shops and specifically designed to lift cars or other vehicles for repair or service. Types covered include: manually driven, power driven, stationary and mobile. Lifts that are movable or designed to tilt the superstructure, or are not "automotive vehicle service lifts" are outside the scope of this standard.

Excluded sections: Entire standard applies.

Substantive points for Officers:

8.1.4 The lift control mechanism must always return to neutral or "off" when released.

8.2.10 There shall be a stop device to prevent the lift from being extended beyond its design limit of vertical lift

8.2.11 There shall be a mechanical device to prevent downward movement of more than 6 inches after stopping motion; this function shall begin within 24 inches of rise and continue to full rise.

10.3 The lift shall be permanently marked to show manufacturer's name and address, rated capacity, model and serial number

10.1.4 This section titled "safety instructions". Manufacturer to provide safety instructions including comprehensive general requirements for safe operation of automotive lifts and an abbreviated safety instruction card which may be posted on or near the lift.

10.1.6 This section titled "inspection and maintenance instructions". Owner/employer to perform maintenance described by manufacturer, including maintenance to be performed only by trained lift service personnel.

Other Points:

APPENDIX G (May 7, 1999)
GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard:	**ASME B30.9-1996: "Slings"**
Reference:	Section 80(2)(a) - Rigging devices

80(2) An employer shall ensure that rigging hardware is constructed, installed, operated, inspected and maintained in accordance with the applicable ASME standard listed below:

(a) ASME B30.9-1996, "Slings"

Scope: Sets standards for the slings made of alloy steel chain, synthetic webbing, wire rope, metal mesh and synthetic fibre rope used for lifting purposes. Does not cover slings used for pulling or other "non-lifting" applications. The sling must be used in conjunction with cranes, hoists, derricks or similar device. Slings used in other applications are excluded.

Excluded sections: Only sections dealing with the physical attributes of the hardware apply. Sections on user duties or precautions are excluded.

Substantive points for Officers:

V	"Shall" means a mandatory provision. "Should" means a recommendation to be considered, the advisability of which depends on the facts of the situation.
9-1.5	An alloy steel chain sling shall have the manufacturer's name, chain grade and size, number of legs, rated load and reach permanently affixed to it
9-3.5	A metal mesh sling shall have an identification affixed to it stating the manufacturer's name and rated load
9-4.5.1	A synthetic rope sling shall be marked to show the manufacturer's name, stock number, rated load, type of material and construction and date of manufacture.
9-5.5	A synthetic webbing sling shall be marked to show the manufacturer's name, stock number, rated load and type of material.

Other points:

1) Attached are drawings of various types of slings.
2) The standard does not require the rated load to be affixed to wire rope slings, although the standard does recommend it (section 9-2.5).
3) The standard contains good information on the installation, operation, inspection, testing and maintenance of slings. Officers can refer clients to these instructions or use them as general guidelines. Note though that an order cannot be written explicitly for violating any of the installation, operation, inspection or maintenance sections of the standard.

APPENDIX H (May 7, 1999)

GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **ASME B30.10-1993: "Hooks"**

Reference: Section 80(2)(b) - Rigging devices

80(2) An employer shall ensure that rigging hardware is constructed, installed, operated, inspected and maintained in accordance with the applicable ASME standard listed below:

(b) ASME B30.10-1993, "Hooks"

Scope: Sets standards for the construction, inspection, operation, testing and maintenance of hooks pictured in the standard (see attached drawings). Hooks other than those pictured are not covered.
The hook must be used in conjunction with cranes, hoists, derricks or similar device. Hooks used in other applications are excluded.

Excluded sections: Only sections dealing with the physical attributes of the hardware apply. Sections on user duties or precautions are excluded.

Substantive points for Officers:

V "Shall" means a mandatory provision. "Should" means a recommendation to be considered, the advisability of which depends on the facts of the situation.

10-1.1.1 The manufacturer's identification shall be forged, cast or die-stamped on a low-stress, non-wearing part of the hook.

10-1.2.1 The manufacturer's identification shall be forged, cast or die-stamped on a low-stress, non-wearing part of the hook.

Other points:

1) Attached are drawings of various types of hooks.
2) The standard does not require the rated load to be stamped on the hook.
3) The standard contains good information on the installation, operation, inspection, testing and maintenance of hooks. Officers can refer clients to these instructions or use them as general guidelines. Note though that an order cannot be written explicitly for violating any of the installation, operation, inspection or maintenance sections of the standard.

APPENDIX I (April 26, 2000)

GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **ASME B30.20-1999: "Below-the-Hook Lifting Devices"**

Reference: Section 80(2)(c) - Rigging devices

80(2) An employer shall ensure that rigging hardware is constructed, installed, operated, inspected and maintained in accordance with the applicable ASME standard listed below:

(c) ASME B30.20-1999, "Below-the-Hook Lifting Devices".

Scope: Sets standards for the construction, installation, operation, inspection and maintenance of below-the-hook lifting devices.

The below-the-hook lifting device must be used in conjunction with cranes, hoists, derricks or similar device. Below-the-hook lifting devices used in other applications, such as automobile wrecking cranes, ship board cranes, automotive jacks, well drilling derricks, etc., are excluded.

Excluded sections: Only sections dealing with the physical attributes of the hardware apply. Sections on user duties or precautions are excluded.

Substantive points for Officers:

V "Shall" means a mandatory provision. "Should" means a recommendation to be considered, the advisability of which depends on the facts of the situation.

20-1.2.1 A nameplate or other permanent marking shall be affixed to a structural or mechanical lifting device displaying the manufacturer's name and address, serial number, lifter weight (if over 100 pounds or 45 kg) and the rated load

20-1.2.2 This section outlines the general construction requirements for the load bearing structural components of a lifter.

20-2.2.1 A nameplate or other permanent marking shall be affixed to a vacuum lifting device displaying the rated load, maximum width and length and minimum thickness. If the vacuum pads can be used individually, the rated load of each pad shall be marked.

20-3.2.1 The rated load shall be marked on a close proximity lifting magnet or on a tag affixed to the magnet

Other points:

1) Attached are drawings of various types of below-the-hook lifting devices.

2) The standard contains good information on the installation, operation, inspection and maintenance of below-the-hook lifting devices. Officers can refer clients to these instructions or use them as general guidelines. Note though that an order cannot be written explicitly for violating any of the installation, operation, inspection or maintenance sections of the standard.

APPENDIX J (May 7, 1999)
GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **ASME B56.1-1993: "Safety Standard for Low Lift and High Lift Trucks"**

Reference: Section 81(a)(i) - Industrial Lift Trucks

81(a) An employer shall ensure that an industrial lift truck is designed, installed, erected, examined, inspected, operated and maintained in accordance with the applicable ASME standard listed below, where applicable,

(i) ASME B56.1-1993, "Safety Standard for Low Lift and High Lift Trucks"

Scope: Sets standards for the design, operation and maintenance of low lift and high lift powered industrial trucks controlled by a riding or walking operator, and intended for use on compacted, improved surfaces. Attached are illustrations of the types of lift trucks covered.

Excluded sections: Entire standard is included in regulation.

Substantive points for Officers:

3.1 All items are mandatory unless the work "should" is used, which are recommendations.

4.2.1 Modifications or additions that affect capacity or safety shall not be done without manufacturer's written approval. Where such approval is granted, all relevant plates and tags shall be updated.

4.2.2 The identity and capacity of front end attachments shall be marked on the truck.

4.2.6 Rebuilding and repair of the basic unit shall follow the manufacturer's criteria and procedures

4.19.1 Personnel who are not trained in lift truck operations may operate a truck only for training purposes and then only under the direct supervision of the trainer

4.19.2 The operator training program shall be presented to all new operators regardless of previous experience

4.19.4 The operator training program shall include:

Issues related to specific truck:

- lift truck characteristics
- similarities to/differences from automobiles
- significance of nameplate data, such as capacity, warnings and instructions
- contents of the operator's manual
- type of power and its uses
- method of steering
- method of braking
- visibility with and without loads, forward and reverse
- load handling capacity, weight and load center
- stability with and without load, with and without attachments
- controls
- load handling capabilities
- fueling, charging in general
- guards

Issues related to specific workplace:

- floor and ground conditions
- ramps and inclines, with and without load
- trailers, railcars, dockboards
- fueling and battery charging facilities
- using trucks in potentially explosive atmospheres
- narrow aisles, doorways, wires, piping
- other lift trucks and vehicles
- use of elevators
- operations near docks or edges of improved surfaces

Operation of the Lift Truck:
- preshift inspections and removal from service
- load handling
- traveling and cornering
- parking and shutdown

Special Operating Rules:
- sections 5.1 to 5.5 of this standard
- employer rules

Practical experience:
- including all operating tasks

4.19.5(a) During training, performance and written and/or oral tests shall be given by the employer. Employers shall establish a pass/fail mark. Appropriate records shall be kept.

5.3.4 Operators must slow down and sound the audible warning at cross-aisles and other locations where vision is obstructed

5.3.7 If the load obstructs the forward view, the operator shall travel with the load trailing

6.2(a) Preventive maintenance shall be done based on manufacturer's recommendations

6.2.8(a) Forks shall be inspected at least every year

7.5.4/5 A nameplate showing the capacity of the lift truck shall be installed on every lift truck

Other points:

1) The standard contains a lot of information on manufacturing requirements that have not been summarized above. For information on these areas, please see the standard itself.

APPENDIX K (May 7, 1999)
GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **ASME B56.6-1992: "Safety Standard for Rough Terrain Forklift Trucks"**

Reference: Section 81(a)(ii) - Industrial Lift Trucks

81(a) An employer shall ensure that an industrial lift truck is designed, installed, erected, examined, inspected, operated and maintained in accordance with the applicable ASME standard listed below, where applicable,

(ii) ASME B56.6-1992, "Safety Standard for Rough Terrain Forklift Trucks"

Scope: Sets standards for the design, operation and maintenance of rough terrain forklift trucks intended for use on unimproved natural terrain and construction sites.

Rough terrain forklift truck is defined as a wheeled truck designed primarily as a forklift with a vertical mast and/or a pivoted boom, variable reach or of fixed length, with or without attachments.

Excludes vehicles deigned primarily:

i) for earthmoving (bulldozers, loaders), even though their buckets/blades are replaced with forks;

ii) as over-the-road trucks equipped with lifting devices.

See the attached drawings for some examples of equipment covered by this standard.

Excluded sections: All parts of the standard related directly to forklifts are included in regulation. Parts of the standard related to the design and operation of dockboards, railcar and other devices are not included in the regulation.

Substantive points for Officers:

4.3.1 All items are mandatory unless the work "should" is used, which are recommendations.

5.1.2 Only authorized, trained persons shall operate forklifts

5.2.1 Modifications or additions that affect capacity or safety shall not be done without manufacturer's written approval. Where such approval is granted, all relevant plates and tags shall be updated.

5.2.2 The identity and capacity of front end attachments shall be marked on the truck.

5.2.3 The user shall see that all nameplates and caution/instruction markings are in place and legible.

5.15.1 Personnel shall not be lifted in a forklift unless there is no other practical option.

5.16.1 Operators of forklifts shall be qualified as to visual, auditory, physical and mental abilities to operate the equipment

6.1.4 Before operating a forklift, the operator must have read the operator's manual

6.3.6 Operators must slow down and sound the audible warning at cross-aisles and other locations where vision is obstructed

6.3.9 If the load obstructs the forward view, the operator shall travel with the load trailing

7.2 Maintenance and inspection shall be done in accordance with the manufacturer's recommendations

8.2 The manufacturer shall provide an operator's manual and a location to store manuals on the truck

8.25 Seat belts shall be provided

Other points:

1) The standard contains a lot of information on manufacturing requirements that have not been summarized above. For information on these areas, please see the standard itself.

2) Note that the detailed training requirements listed in the standard for Low Lift and High Lift Trucks are not reproduced in this standard. However, section 5.17.4 does give recommendations for a training program. These recommendations are less thorough than the ones in the other standard.

APPENDIX L (May 7, 1999)
GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **A10.3-1995, "American National Standard for Construction and Demolition Operations - Powder-Actuated Fastening Systems - Safety Requirements"**

Reference: Section 108(3) - Powder-actuated tools

108(3) An employer shall ensure that a powder-actuated tool, the fastener and the powder load complies with the requirements of ANSI standard A10.3-1995, "American National Standard for Construction and Demolition Operations - Powder-Actuated Fastening Systems - Safety Requirements".

Scope: Applies to powder-actuated tools used on hard structural surfaces, such as cement floors and walls, ceilings and steel structural members
Does not include devices designed for attaching objects to soft materials, like wood, plaster, tar or gyproc) or brittle materials, like cast iron, tile, hardened steel, glass block and most brick.

Excluded sections: Parts that deal with operator and instructor competence (parts 10 and 11).

Substantive points for Officers:

1.2 Existing powder-actuated tools meeting the criteria of the 1985 standard need not be modified to meet this standard.

4.1.3 Actuation of the tool shall require at least two separate and distinct operations, one of which is not holding the tool against the target surface.

4.1.4 The tool shall be designed to require a force of 22 N (5 pounds) to be applied against the work surface before it will fire.

4.1.8 Each tool shall be marked with the model designation and serial number.

4.1.9 Each tool shall be provided with a lockable container labeled "powder-actuated tool"

7.4 High velocity class powder-actuated tools (piston speeds of more than 150 m/s or 492 ft/s) shall not be used unless specially authorized by:
- a certified safety professional (the American equivalent of the CRSP)
- an engineer
- the manufacturer of the powder-actuated tool

The authorization shall:
- contain an expiration date
- be limited to a specific job site
- be limited to a specific use or application

7.6 Eye or face protection shall be worn by operators, assistants and by-standers

7.17 A sign, saying "powder-actuated tool in use" or similar words shall be placed in the area where the tool is being used and in any other area exposed to a hazard from the tool. The sign shall be at least 20 cm by 25 cm (8" x 10").

8.1 Powder-actuated tools shall not be used in explosive or flammable atmospheres.

8.2 Powder-actuated tools shall never be left unattended in a place where unauthorized persons would have access to them.

9.1 A record of inspections shall be kept, recording the inspections recommended by the manufacturer.

9.2 Instruction manuals, tools and accessories for use with powder-actuated tools shall be stored in the tool containers when not in use.

Other points: None.

APPENDIX M (July 31, 2000)
GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **CSA W117.1-94, "Safety in Welding, Cutting and Allied Processes"**

Reference: Section 109(2) - **Welding, Cutting, Burning and Soldering**

109(2) An employer shall comply with the requirements of CSA standard CSA-W 117.2 -94, "Safety in Welding, Cutting and Allied Processes".

Scope: Sets standards for the safety of all personnel working in an environment affected by welding, cutting or allied processes. The standard does not cover the design or manufacture of welding equipment.

Excluded sections: All sections are included in the regulations.

Substantive points for Officers:

Definitions: "Qualified" means someone who has been identified by a "certifying body" (a term the standard does not define) to perform a certain job. Officers should assume that appropriate certifying bodies include the Canadian Welding Bureau, Welding Institute of Canada, American Welding Society, the Industrial Accident Prevention Association and similar associations. Officers should ask for written proof of such certifications.

"Shall" indicates a mandatory provision; "should" indicates a non-mandatory provision.

3.1 This clause of the standard is poorly worded from a regulatory standpoint. For clarity, the following directions are given.

a) Clause 3.1 says a welding health and safety program is "recommended"; clause 3.2.1 makes one mandatory. Officers shall treat such programs as recommended; that is, not mandatory.

b) Clause 3.1 says that gouging is covered. However, since the scope of the standard says it covers those items listed in Appendix A and gouging is not listed, officers shall treat gouging as outside the scope of the standard and thus not covered.

3.2.1 The employer shall:

a) implement a welding health and safety program
b) ensure that equipment is in safe working order
c) carry out a hazard assessment
d) implement engineering controls to eliminate hazards wherever possible
e) ensure personal protective equipment is used as required
f) conduct a periodic evaluation of the program
g) provide a written description of the program (officers should assume this means provide each affected employee with a written summary of the welding H&S program or post such a summary)
h) train personnel working in the welding environment, in health and safety procedures

Although the standard does not explicitly require it, Officers shall require the program to be in writing.

3.2.3 The Joint Occupational Health and Safety Committee (where such exists) shall:

a) help identify hazardous situations or unsafe practices
b) inspect the workplaces in cooperation with the employer
c) assist in the evaluation of the health and safety program

3.2.4 The welding health and safety program shall contain components dealing with:

a) hazard identification
b) safe working procedures for the welding equipment in use
c) control implementation
d) training
e) evaluation

4.4.1 Coatings shall be removed from all surfaces before welding whenever reasonable practicable.

4.4.2(a) Parts which have been degreased shall be completely free of solvent before being welded.

5.1.1 Arc welding equipment shall bear evidence of the equipment's approval on the nameplate.

5.2.1(d) Arc welding equipment shall be turned off whenever it is not operating.

5.2.1(l) All persons exposed to sparks or electric shock from arc welding shall carry items that cannot catch fire, such as lighters and matches.

5.3.2.2 The metal workpiece shall be grounded unless a qualified person assures it is safe to work on.

5.3.2.8 Pipelines carrying hazardous materials shall not be used as part of an arc welding return circuit.

5.3.2.10 Cranes, hoists, chains, wire ropes and elevator structures shall not be used as part of an arc welding return circuit.

5.4.5 When the welder leaves the arc welding work area or stops for any appreciable length of time, the welding machine shall be turned off.

8.3.3 Oxygen cylinders, equipment, pipelines or apparatus shall not be used interchangeably with any other gas.

8.5.2.3 Matches or cigarette lighters shall not be used to light torches.

8.5.2.5 Oxyfuel equipment shall be shut off and removed from a confined space whenever the torch is not being used over lunch, overnight or for similar periods.

8.6.3 Tape shall not be used to repair gas leaks. Proper hose slicing shall be done.

8.6.5 Hose connections for welding shall not be used for any breathing apparatus or other equipment

8.7.6 All pressure reducing regulators shall be checked annually to determine that they are still working properly

8.8.1.4 Cylinders that do not have legible stencilling, stamping or labelling identifying their contents shall not be used.

8.8.1.9 Cylinders showing corrosion, damage or fire exposure shall not be used

8.8.2.2 Cylinders shall be separated from flammable/combustible liquids and easily ignited materials such as wood, paper, oil and grease by at least 6 m (20 feet) or by a combustible barrier at least 1.5 m (5 feet) high with a fire rating of at least 30 minutes

8.8.3.6 Except when in use or connected for use, all cylinders designed to accept valve protection caps shall have those caps in place and handtight

8.8.4.12 A suitable device shall be used to keep cylinders upright

8.8.4.13 Cylinders shall be protected from sparks, slag or flame by appropriate distances or by fire resistant shields

8.9.5.1 In a manifold, each fuel gas cylinder shall be provided with a backflow check valve. Note that the standard does not require such devices on oxygen cylinders

8.9.5.2 When acetylene cylinders are coupled, flash arrestors shall be installed between each cylinder and the coupling block

10.1.2 Warning signs, indicating the appropriate type of personal protective equipment required, shall be posted in conspicuous areas near welding operations

10.2.1.1 Goggles or safety glasses with side shields shall be worn by all welding personnel in a welding area, even when other eye and face protection is worn

10.3.2 All welders shall wear flame resistant gauntlet gloves, aprons and leggings

10.6.3 In confined space situations, the outside watcher shall continuously hold the welder's safety rope in order to receive a signal for help. The outside watcher shall have an alarm to summon help

10.6.5.1 Gas cylinders shall be located outside a confined space that is being worked on

10.6.6.3 No flame shall be lit or extinguished inside a confined space

10.7.1 Any fire hazard within 15 m (50 feet) of a welding operation must be guarded

10.7.2(d) Fire watchers shall be used whenever:

i) combustible material is closer than 15 m from a welding operation

ii) combustible material is farther than 15 m from a welding operation but is easily ignited by sparks

iii) wall or roof openings with 15 m expose flammable materials

iv) combustible material is adjacent to the opposite side of metal walls, partitions ceilings and roofs and is likely to be ignited by heat conduction or heat radiation

10.7.2(e) Fire watchers shall:

i) be trained in the use of fire extinguishers

v) continue the fire watch for at least 30 minutes after the completion of the welding operation

11.4 Exhaust from a welding ventilation system may be recirculated if it is first passed through a high efficiency filter (preferably HEPA, but that is not mandatory) and the system has a device that will automatically stop recirculation if the filter fails

12.1 Welding personnel shall be trained by qualified persons. The standard explicitly excludes training of maintenance personnel.

12.2 The training course shall consist of at least:

i) hazard identification
ii) safe welding practices
iii) fire and safety precautions
iv) methods to control hazards
v) the use, maintenance and limitations of personal protective equipment

13.1 The effectiveness of the welding health and safety program shall be periodically evaluated.

Other points:
The standard also contains requirements for:
- resistance welding
- laser welding
- electron beam welding
- robotic operations
- radiography
- welding for public demonstrations

As these are considered rare, they have not been summarized here. Officers who come across such activities should consult the standard.

The standard contains a rare amount of information that just describes the hazards of the various types of welding. Officers interested in such general information should consult the standard.

For information, the colours for gases are:
- green for oxygen (note that this conflicts with the international standard which sets blue as oxygen's colour)
- red for acetylene, hydrogen or liquified petroleum gas
- black for inert gases, compressed air and water

The standard though does not require that these colours be used.

APPENDIX N (May 7, 1999)

GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **CAN/CSA-M421-93: "Use of Electricity in Mines"**

Reference: Section 120(2) - Electrical Safety - General provisions

120(2) The employer operating a surface mine shall ensure compliance with CSA standard CAN/CSA-M421-93, "Use of Electricity in Mines".

Scope: Sets standards minimum requirements for all electrical work and electrical equipment operating, or intended to operate, in mines and quarries

Excluded sections: Only sections dealing with the mines in general and surface mines are included. Underground mines and underground coal mines (sections 5 and 6 respectively) are not part of this regulation. They are covered by the Underground Mining Regulations.

Substantive points for Officers:

3.2.1 Owner or operator shall give written notice to the Department of Labour of the intent to connect or reconnect an electrical system

3.2.2 Owner or operator shall disconnect electrical system before abandoning or leaving unattended a mine, and notify the Department of Labour within 14 days

3.2.3.1 An electrical plan shall exist at each mine, which indicates:
- the position of all fixed apparatus
- the routes of all power and branch feeders
- the rating of all electrical feeder-control apparatus and equipment

3.2.5.2 Temporary wiring not in compliance with the standard is permitted if:
- danger to life or safety is involved
- qualified supervision is provided
- suitable barriers and warning signs are installed or provided

3.2.9.1 A fire-extinguishing device shall be provided in each electrical equipment room or vault

3.2.9.2 The fire extinguisher used in 3.2.9.1 shall be:
- approved for use on electrical fires
- sized for the size and type of equipment
- located at an exit from the area
- maintained in condition for immediate use

3.3.1 Jackets on cables shall remain unpainted

3.4.5.1 Every accessible section of an electrical conveyor belt shall be provided with a pull-cord extending the full length of the section and able to stop the conveyor on an emergency basis.

3.4.5.3 Where a conveyor is started automatically or where a portion of the conveyor is not visible from the operator's position, the conveyor shall have a start-up warning device.

3.4.6.4 All electrical overhead cranes shall be provided with a form of dead-man control

4.2.3 Where a fire hazard exists, an electrical equipment room shall have a fire-alarm system

4.7.2.1 Where fire-fighting is an unacceptable hazard to general personnel, an electrical equipment room shall have:
- an automatic fire-suppression system
- signs instructing employees how to proceed in the event of a fire at all accesses to the area

4.7.3.5 All 120 volt outlets and their supply circuits shall be equipped with CSA-approved ground fault circuit interrupters

4.7.7.2 An emergency-stop shall be provided on the operators' console to ensure that the machine can be safely and quickly stopped

Other points: None.

APPENDIX O (July 29, 1999)

GENERAL SAFETY REGULATIONS SUMMARY OF A STANDARD

Standard: **CSA Z94.4-93, "Selection, Use, and Care of Respirators"**

Reference: Section196(b) An employer shall ensure compliance with CSA standard CSA Z94.4-93, "Selection, Use, and Care of Respirators" with respect to the use, maintenance and testing of respiratory protective equipment.

Scope: Sets standards for the selection, care and use of respiratory protective devices and for the administration of a respirator program.

Excluded sections: The standard excludes:
- underwater breathing devices
- aircraft oxygen systems
- military masks
- inhalators and resuscitators

Note that "selection" is not included in regulation. Thus, the part of the standard dealing with respirator selection (clause 6) is not covered. Hazard identification and quantitative and qualitative fit testing are also excluded by implication, as the standard indicates they are done solely for the purpose of respirator selection.

Substantive points for Officers:

1.3 "Shall" indicates a mandatory provision; "should" indicates a non-mandatory provision. The notes in the standard are not mandatory.

3.1 Respirators may only be used where engineering or administrative controls are not practical, except where such controls are being installed or repaired and in emergencies.

3.2.1 Written operating procedures must be prepared and implemented

3.4 A written program shall be prepared consisting of:
- program administration
- training
- use, inspection and monitoring
- cleaning, inspection, maintenance and storage
- health surveillance
- program evaluation

4.4 All respirator users shall receive written instructions

8.1.2 Records shall be kept of the type of training each person receives, as well as the date. Records are to be kept for the duration of the employment of the person trained.

8.3.1 Respirator users shall be trained in:
- nature, extent and effects of respiratory hazards that may be encountered
- operations, limitations, capabilities of the respirator
- inspection, donning, removal, fit-testing, wearing the respirator (must include sufficient hands on practice)
- maintenance and storage of the respirator
- dealing with emergencies, respirator malfunctions

9.1.1.1 Persons using positive-pressure or negative-pressure respirators shall be clean shaven where the facepiece seals to the kin

9.1.1.4 Use of contact lenses is permitted

9.2.1 In IDLH atmospheres, only SCBA or positive-pressure air line with an auxiliary SCBA shall be worn.

9.2.3 Program administrator shall:
- monitor correct wearing of respirators

- monitor good condition of respirators
- document problems with respirators

9.3.4 When SCBA is used, one person shall remain outside the respiratory protection area and maintain an awareness of the number of persons using SCBA, their location and function and time of entry

9.3.5 When SCBA is used, persons with SCBA shall be available for rescue. These persons may be assigned other duties that do not interfere with there rescue function. They need not be immediately outside the SCBA use area.

10.1.1 Records shall be kept to ensure that each respirator is properly:

- cleaned and sanitized
- inspected, tested and repaired
- stored

10.3.2 Respirator inspection shall include a check for:

- tightness of connections
- conditions of components
- end-of-service-life indicator
- shelf-life dates
- proper functioning of alarms, regulators, warning devices
- SCBA cylinders filled to proper pressures
- pliability and deterioration of elastomeric parts

10.5.1.1 Respirators shall be stored to protect them from:

- ozone, sunlight
- heat, cold
- moisture
- vermin
- damaging chemicals, oils, greases

12.1.2 The standard operating procedures shall be reviewed annually by the Program Administrator.

Other points:

Although not legally enforceable, the standard parts on hazard identification, respirator selection and fit testing are well written and may provide useful guidance for clients.

APPENDIX P (August 11, 1999)
USE OF "AND" AND "OR" IN REGULATIONS

Regulations use the terms "and" and "or" frequently, especially in lists. In cases where the word "and" is used, all items in the list must be done to comply with the section. In cases where "or" is used, compliance with any one or more items on the list would be compliance with the entire list.

Examples are:

16(1) An employer shall ensure the provision of lighting that is sufficient for the type of work being done considering

- (a) the quantity of illumination; and
- (b) the quality of illumination, including reflectance, direct glare and reflected glare.

In this case, both the *quantity* and the *quality* of the lighting must be sufficient. Sufficiency in only one would not be enough to comply with the section.

On the other hand, we have:

34(2) Where unconsolidated bulk material is stockpiled and removed by means of powered mobile equipment, an employer shall ensure that

- (a) the working face of the unconsolidated bulk material is sloped at the angle of repose;
- (b) the vertical height of the working face of the unconsolidated bulk material is not more than 1.5 m above the maximum reach of the equipment; or
- (c) the stockpiling and removal is done in accordance with the specifications certified by an engineer following consultation with the committee or representative, if any.

In this latter case, the word "or" allows the employer to choose any of the three listed methods to achieve full compliance with the section.

APPENDIX Q (July 16, 2002)

"COMPLY WITH" VS "APPROVED BY" IN REGULATIONS

Laws may require that a device or procedure:

- complies with or meets the requirements of a standard;
- is approved by or certified by a standard setting or other agency or person.

These are different requirements.

When the law uses the terms "complies with" or "meets the requirements of", the law is leaving it open to the user to determine how this is to be done. For instance, section 11 requires a hard hat "that complies with CSA Standard

(a) CAN/CSA-Z94.1-92 (R1998), "Industrial Protective Headwear"; or
(b) CSA - Z94.1 - M1977, "Industrial Protective Headwear"."

This then leaves it open to the employer to comply with the law through:

(1) actually using a hard hat certified to one of the CSA standards
(2) using the ANSI-certified hard hat standard, which is equivalent to the 1977 CSA standard
(3) using some other means of obtaining a hard hat that would meet the CSA standards.

Alternatively, the law may say "approved by" or "certified by". An example of this is found in the "General Blasting Regulations", which requires codes of practice "approved by the Director".

In this case, the codes of practice used must be the precise ones approved by the Director. There is no discretion to use an alternative code that, although it may be equally safe, differs from the code the Director actually approved.